ECONOMICS BACKGROUND DOCUMENT

ESTIMATE OF POTENTIAL NATIONAL COST SAVINGS FOR THE INDUSTRIAL HAZARDOUS WASTE "STANDARDIZED" RCRA PERMIT PROPOSAL

Prepared by:

Economics, Methods & Risk Analysis Division
Office of Solid Waste
Mailstop 5307W
US Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460 USA
Phone: 703-308-8615
Fax: 703-308-0509
http://www.epa.gov/epaoswer/osw/

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PREFACE

This document was prepared by Mark Eads of the Economics, Methods and Risk Analysis Division (EMRAD), of the Office of Solid Waste (OSW), US Environmental Protection Agency (USEPA). This document presents the findings of an economic study in support of the USEPA's "Standardized" RCRA permit proposal. During the public comment period identified in the preamble to the Federal Register announcement of the proposal, the public may provide to the RCRA Docket, comments, supplementary information, and data for revision and improvement of this study. EMRAD will revise this study prior to finalization of the proposal.

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EXECUTIVE SUMMARY

This "*Economics Background Document*" begins with an overview of the regulatory features of the USEPA Office of Solid Waste's "*standardized*" RCRA permit proposal. By its design, the purpose of the "standardized" permit is to *streamline* the RCRA permit process, by allowing certain types of hazardous waste management facilities to obtain, modify, and renew operating permits more easily, while maintaining the environmental protectiveness of the existing permit process.

The proposed rule will apply to **non-thermal treatment and storage facilities** (TSFs) which operate any of the following three types of ***on-site*** (i.e. "captive" or "non-commercial") **industrial hazardous waste** management units (these are defined at 40 CFR 260.10):

- Tank systems
- Containers
- Containment buildings

Only these types of facilities which meet RCRA's ***clean closure*** standards are eligible. As explained in the preamble to the Federal Register announcement, the "standardized" permit proposal targets these three types of units because they:

- Are in common usage in the United States.
- Are relatively simpler types of units to construct/install and operate.
- Are frequently based on standard, "off-the-shelf" engineering, materials and operating designs.

Potential waste management cost savings for the standardized permit proposal, stem from the anticipated reduction in average annual recurring permitting resources for both (a) the eligible universe of industrial hazardous waste TSFs, and for (b) USEPA/state RCRA permitting authorities -- associated with TSFs preparing and with USEPA/states reviewing, respectively – four types of RCRA hazardous waste management **permitting activities**:

New permits:	New permit applications from "interim status" and future newly-constructed TSFs.
Modifications:	Applications for modifications to existing permits (40 CFR 270.42 classes): • Routine changes (i.e. class 1 or class 2 modifications). • Significant changes (i.e. class 3 modifications).
Renewals:	Applications for renewal of existing permits.
Conversions:	Application for conversion (switching) of existing permits before expiration and renewal.

The standardized permit proposal contains three levels of potential **administrative cost savings** to owners and operators of TSFs and to USEPA/states, consisting of 15 cost savings items listed in the Federal Register announcement (FR Tables 1, 3 and 4):

Permit application/review savings:	Of the **14 steps** listed under the existing individual permit process (under 40 CFR 124 & 270), the standardized permit process proposes to drop five of these 14 steps (see Table 1 of the FR announcement).
Permit provisions savings:	Of the **23 provisions** associated with the individual permit process (i.e. under 40 CFR 270), the standardized permit process proposes to reduce the administrative burden of four of these 23 provisions (see Table 4 of the FR announcement).
Permit technical content savings:	Of the **24 technical**, general facility and unit-specific standards associated with individual permits (i.e. under 40 CFR 264), standardized permits reduce or eliminate six of these 24 technical standards (as described in the proposed new part 40 CFR 267); (see Table 3 of the FR announcement).

Based on a comparison of the administrative burden for reporting, recordkeeping, and review activities, associated with the proposed "standardized" RCRA permit process, compared to the conventional RCRA permit process, this document presents an estimate of:

- **$100 to $5,800** in burden cost savings per permit action (i.e. a reduction of **2 to 140 hours** per action), which represents **4% to 14% burden reduction** compared to conventional permit actions.
- **$0.38 to $0.53 million** in potential average annual, national cost savings associated with a future stream of about 120 eligible RCRA permit actions per year for standardized permits.
- **24%** of national savings are expected to acrue to eligible TSFs, and **76%** to permit authorities.

This cost savings estimate is based upon: (a) analytic framework of a 30-year future savings stream over the years **2001 to 2030**, discounted at **7.00%**; and (b) data and working assumptions borrowed from 1999 USEPA "Information Collection Requests" (ICRs) related to both "standardized" and to conventional RCRA permits. The final section of this study presents a sensitivity analysis of the estimated national cost savings to four parameters (i.e. number of future years in the period-of-analysis, discount rate, average annual number of relevant permit actions, and inflation rate).

ESTIMATE OF POTENTIAL NATIONAL COST SAVINGS FOR THE INDUSTRIAL HAZARDOUS WASTE "STANDARDIZED" RCRA PERMIT PROPOSAL

I. INTRODUCTION

I-A. What is the Purpose of This Economics Background Document?

This document presents an economic analysis which estimates a range of **$0.36 to $0.53 million per year** in *potential national* ***cost savings*** associated with future implementation of the USEPA Office of Solid Waste's RCRA[1] hazardous waste "Standardized Permits" proposal, as described in the Federal Register announcement. This cost savings estimate is based upon an assumed future annual average of **about 120 eligible RCRA permit actions** under the "standardized" RCRA permit program, consisting of a reduction in administrative burden to eligible facilities and to permitting authorities combined, ranging from **$100 to $5,800 per action** (i.e. a burden reduction of between **2 to 140 hours per action**). This represents a range between **4% to 14% in burden reduction** compared to conventional RCRA permit actions.

"RCRA" is the Resource Conservation and Recovery Act of 1976 which provided the USEPA with Congressional authority to regulate the management of municipal and industrial solid waste (non-hazardous and hazardous). RCRA permits provide owners and operators of waste treatment, storage and disposal facilities (TSDFs) with the legal authority to operate such hazardous waste handling facilities. Permits establish the administrative and technical conditions (standards) under which waste at a facility must be managed to ensure that hazardous waste is handled in a controlled manner that is protective of human health and the environment.

The potential waste management cost savings estimated in this document, consist of the *incremental difference* between the national average annual recurring cost associated with the current RCRA hazardous waste management permit program (i.e. baseline cost for "***conventional***" RCRA permits), compared to the estimated average recurring annual cost associated with the proposed "***standardized***" RCRA permit program.

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[1] The USEPA's "RCRA Orientation Manual" (report nr. EPA-530-R-98-004, May 1998, 290pp.), contains descriptive information about the USEPA's hazardous waste program and regulations, as authorized by Congress in Subtitle C of the 1976 Resource Conservation and Recovery Act. Hardcopies of the Manual are available to the public by calling the National Service Center for Environmental Publications (800-490-9198); an electronic copy is available over the Internet at http://www.epa.gov/epaoswer/general/orientat/index.htm . Further information about RCRA, and about the USEPA's Office of Solid Waste, respectively, is available from the RCRA Public Hotline (800-424-9346 or via the Internet at http://www.epa.gov/epaoswer/hotline), and on USEPA's Office of Solid Waste website at http://www.epa.gov/epaoswer/osw.

I-B. How Does a "Standardized" Permit Compare to Other Types of Streamlined Permits?

The USEPA designed the "standardized" RCRA permit as a time- and administrative resource-saving, streamlined alternative to the conventional RCRA permit program. The development and rationale of the "standardized" RCRA permit proposal are explained in the preamble to the Federal Register announcement for the proposal.

In comparison to this "standardized" RCRA permit proposal, there are also two RCRA permit administrative ***streamlining mechanisms*** already in place in the RCRA regulations at 40 CFR[2] 124.4:

Consolidation: Whenever a given facility requires a permit under the following four environmental regulatory programs, processing of two or more permit applications may be ***consolidated*** upon request of the applicant facility, or at the discretion of the permitting authority (also sometimes called "*uniform permitting*" by states):

- RCRA permits required under 40 CFR 270.1.
- Safe Water Drinking Act "underground injection control" (UIC) program permits required under 40 CFR 144.1.
- Clean Air Act air quality "prevention of significant deterioration" (PSD) permits under 40 CFR 52.21.
- Clean Water Act "National Pollutant Discharge Elimination System" (NPDES) permits under 40 CFR 122.1.

The first step in consolidation is to prepare and submit to USEPA/states each permit application at the same time. The respective permit application public hearings and comment periods may also be consolidated into a single hearing and comment period (40 CFR 124.82).

Coordination: 40 CFR 124.4 also allows USEPA/states to consolidate permit processing when draft permits are prepared, to issue the final permits together, and to ***coordinate*** the expiration dates of any new permits with the expiration dates of existing permits so that all permits at a given facility expire simultaneously.

In addition to *consolidation* and *coordination*, state-level permitting authorities in environmental regulatory programs also may use two other permit streamlining mechanisms (source: "Existing State Permitting Programs: Draft Report", OSW, 30 May 1997, 5pp.):

General permits: Which cover more than one waste source (e.g. air emissions, wastewater and solid waste).

Tiered permits Which follow specified processing procedures.

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[2] CFR= United States **Code of Federal Regulations**; The CFR is published by the Office of the Federal Register, National Archives and Records Administration (NARA). The CFR is an annual codification of the general and permanent rules published daily in the **Federal Register** (FR) by the Executive departments and agencies of the Federal Government. It is divided into 50 titles which represent broad areas subject to Federal regulation. Title 40 of the CFR is "Protection of Environment", and contains USEPA's regulations. The CFR is kept up to date by the individual daily issues of the Federal Register, and each volume of the CFR is updated annually. Full text of the CFR and the FR are available in electronic format at NARA's Internet website: http://www.nara.gov/fedreg or at the US Government Printing Office's website http://www.access.gpo.gov/nara .

The concept of ***regulatory permit streamlining*** dates back in the USA to the 1970s, before the start of the USEPA's RCRA permit program. For example, the Conservation Foundation of Washington DC completed a four-year "Industrial Siting Project[3]" in 1983, which served to survey and summarize the various different types of permit streamlining mechanisms in place during the 1970s and 1980s. Although not specific to the USEPA RCRA permit program, the published findings of that project provide one source of descriptive documentation about prior regulatory permit streamlining ideas and applications.

More recently, although largely stemming from a different context and on a separate regulatory development track from the "standardized" RCRA permit proposal, USEPA published a "Notice of Data Availability" on 18 June 1999 (Federal Register, Vol.64, No.117, pp.32859-32868), announcing the Agency's ideas and intention to streamline the RCRA hazardous waste information reporting and recordkeeping burden to the RCRA regulated community.

The June 1999 RCRA streamlining announcement seeks public comment (by 20 Sept 1999) on four RCRA program burden reduction ideas – electronic reporting, reduced reporting, longer self-inspection intervals, and reduced training – and the announcement identifies 15 other burden reduction efforts (nine specific to the RCRA program, and six broader Agency burden reduction initiatives) underway in the USEPA. The following Internet website provides additional descriptive information about these other USEPA RCRA streamlining efforts: http://www.epa.gov/epaoswer/hazwaste/data/burdenreduction .

I-C. How May the Public Participate in This Economic Analysis?

Public comments are encouraged about the scope, design, supporting data, information references, working assumptions and computations applied in this document. The public is also encouraged to sumit any supplementary information and data which may improve the accuracy, representativeness, or comprehensiveness of this study.

Before finalizing and promulgating the standardized RCRA permit, the USEPA must consider and respond to all public comments on the initial proposal, as well as revise this Economics Background Document in response to comments.

The public may submit comments directly to the USEPA's **RCRA Docket**, according to the directions and deadline described in the preamble to the Federal Register announcement for the standardized RCRA permit proposal. The public may contact the USEPA for further information and instruction about how to submit comments, by contacting the **RCRA Hotline** via telephone at 800-424-9346, or via the Internet at http://www.epa.gov/epaoswer/hotline .

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[3] Duerksen, Cristopher J., Environmental Regulation of Industrial Plant Siting: How to Make it Work Better, The Conservation Foundation, Washington DC, 1983, 272pp. Three chapters from this published study provide a survey of permit streamlining in the 1970s and 1980s:

- Chapter 4: "The Permitting Maze Syndrome" (pp.79-108).
- Chapter 5: "Attempts to Improve the [Multiple-Permit Problem] Rules: Reforms of the 1970s" (pp.109-148).
- Chapter 6: "Responses to the Real Problems: Permit System Innovations for the 1980s" (pp.149-204).

The Conservation Foundation was founded in 1948 as a nonprofit research and communication organization dedicated to encouraging human conduct to sustain and enrich life on Earth. At the date of this study. the Foundation was headed by William K. Reilly, who became Administrator of the USEPA from February 1989 to January 1993.

II. BACKGROUND TO RCRA PERMITS AND TO THE "STANDARDIZED" PERMIT PROPOSAL

II-A. What Types of Hazardous Waste Management Units are Eligible for "Standardized" Permits?

Before identifying the types waste management units (WMUs) eligible for "standardized" RCRA permits, it is important to define "***units***", in comparison to waste management "***facilities***". The USEPA RCRA program defines a hazardous waste management *facility* as:

> "*All contiguous land and structures, and other appurtenances and improvements on the land, used for treating, storing or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g. one or more landfills, surface impoundments, or combinations of them)*." (40 CFR 260.10)

According to nationwide data collected by the USEPA, the number of waste treatment, storage and disposal (TSD) *units* per RCRA permitted waste management *facility*, ranges from one to 500 units per facility (including Federally-operated TSDFs). Based upon the overall distribution of number of units per facility across a regional sample of 100 RCRA TSDFs[4], the USEPA developed the following **units-per-facility size classes**:

- Small facility= 1 to 2 units
- Medium facility = 3 to 6 units
- Large facility = 7 or more units

As currently designed, the proposed "*standardized*" RCRA permit applies to **non-thermal treatment** and **storage** facilities (TSFs) which operate any of **three types** of ***on-site*** (i.e. "captive" or "non-commercial") hazardous waste management units. Hazardous waste disposal facilities are not eligible for standardized permits. The three types of eligible units are defined at 40 CFR 260.10, and are also defined and described in supplemental USEPA documents[5]):

Tank systems: Stationary (non-portable) structural receptacle or vessel with associated ancillary equipment and secondary containment system, used to store or treat hazardous waste in accordance

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[4] The reference sample of 100 TSDFs is a non-random sample located in and selected by USEPA Region 4, which consists of eight states (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee). The sample size classes are reported in Revised Draft Report on Analysis of Cost Estimates for Closure and Post-Closure Care, prepared for the USEPA Office of Solid Waste, by PRC Environmental Management Inc. (Contract nr. 68-W4-0007, Work Assignment nr. R11007), 15 Oct 1996, 31pp. These units-per-facility size classes are subject to future revision by the USEPA as nationwide data about TSDF units contained in the USEPA-OSW's "RCRIS" (Resource Conservation & Recovery Information System) database are reviewed and analyzed.

[5] The series of USEPA RCRA Hotline training modules provide descriptions of individual types of TSDFs:
Tank systems: EPA-530-R-97-072, Nov 1997, 24pp. http://www.epa.gov/epaoswer/hotline/training/tank.pdf .
Containers: EPA-530-R-97-049, Nov 1997, 22pp. http://www.epa.gov/epaoswer/hotline/training/ctain.pdf .
Containment bldgs: EPA-530-R-97-050, Nov 1997, 16pp. http://www.epa.gov/epaoswer/hotline/training/cbuld.pdf .

with the RCRA technical standards of 40 CFR 264 & 265 Subpart J. Tanks are widely used for storage accumulation or treatment of large volumes of wastes (and other materials), and may range in size from hundreds to millions of gallons in volume per tank. There are basically three possible installation tank designs:

- Above-ground.
- Above-and-below-ground (or "in-ground").
- Underground.

Tanks may be covered or uncovered (i.e. with or without roofs), and may be classified according to two "levels":

- "Level 1" tanks store wastes with low vapor pressure.
- "Level 2" tanks store wastes with high vapor pressure.

[*Note that underground tanks are not eligible for standardized permits*].

Containers: Any portable device in which a hazardous waste is stored, transported, treated, disposed of , or otherwise handled in accordance with the RCRA technical standards of 40 CFR 264 & 265 Subpart I. Containers are one of the most commonly used and diverse forms of hazardous waste storage. Some examples include:

- 55-gallon drums.
- Large tanker trucks.
- Railroad cars.
- Small buckets.
- Test tubes.

Small containers are usually between 26 and 119 gallons, and *large* containers are greater than 119 gallons.

- "Level 1" containers store wastes with low vapor pressure.
- Large containers which store wastes with high vapor pressure are "level 2" containers.
- "Level 3" containers are used for waste stabilization.

Containment buildings: A completely enclosed, self-supporting structure (i.e. with four walls, a roof, and a floor), used to store or treat non-containerized hazardous waste, under the RCRA technical standards of 40 CFR 264 & 265 Subpart DD.[6] Containment

[6] 40 CFR Part 264 establishes minimum national **design and operating standards** which define the acceptable management of RCRA hazardous wastes, applicable to owners and operators of all facilities which treat, store, or dispose of hazardous waste, except as specifically excluded from RCRA regulations (specific waste exclusions from RCRA are listed in 40 CFR 261). These standards cover design, construction, operation, maintenance, closure, and financial assurance requirements to ensure proper and safe operation of hazardous waste management units (facilities).

40 CFR Part 265 is similar and in some instances almost identical to Part 264, although it applies to "**interim status**" hazardous waste TSD facilities, which are facilities already in existence and operating when regulatory amendments to RCRA become effective and render these facilities subject to permitting, as opposed to "permitted facilities" which are newly constructed TSDFs after

buildings are generally used for the management of hazardous waste debris and other bulky and high volume hazardous wastes, and also non-liquid hazardous wastes. Containment buildings may also manage liquid wastes if special equipment has been installed. Unit size may range from less than 100 to over 100,000 square feet in floor area.

Furthermore, only these types of facilities which meet RCRA's ***clean closure*** standards are eligible.

The USEPA identified these three types of eligible waste management units because these units are relatively simple to design and properly construct. The engineering and construction knowledge and skills necessary to design and construct these units are relatively basic. These units are in common usage in many applications and are frequently bought "off-the-shelf" or built from "off-the-shelf" designs. Industry associations and standards organizations have developed engineering, material and operating standards for these three types of units which are in widespread use in the USA. Past experience with these units indicates that they are simpler to design, construct, and manage compared to other hazardous waste management units such as combustion units (i.e. incinerators, boilers, furnaces) or land disposal units (e.g. surface impoundments, landfills, land treatment).

For purpose of providing an overall context relative to the universe of all types of RCRA TSDFs, Table 1 below presents the prevalence of each of eight types of waste management units, as a percentage of all RCRA units. Compared to the universe of all unit types, the three eligible units represent **50%** of all RCRA TSDF units (i.e. 29.3% + 20.7%).

Table 1: Prevalence of Types of RCRA Waste Management Units

Rank	Type of RCRA Permitted Unit	Prevalence*
1	**Containers, Containment buildings**	**29.3%**
2	Surface impoundments	23.2%
3	**Tank systems**	**20.7%**
4	Landfills	11.0%
5	Incinerators, boilers & industrial furnaces	6.9%
6	Wastepiles	4.9%
7	Land treatment units (land farming)	3.7%
8	Drip pads	1.2%

such effective date. The RCRA "interim status" category recognizes and allows existing TSDFs to gradually come up to speed with the standards for (new) permitted facilities. The "interim status" standards of Part 265 are often less stringent than Part 264 standards, and there are circumstances where the standards for new facilities would be impracticable for existing "interim status" facilities to implement immediately.

Apart from **general facility standards** (Subparts A-H), many of the Subparts of both 40 CFR Parts 264 and 265 address specific types of hazardous **waste management units**: Subpart I=containers, J=tank systems, K=surface impoundments, L=wastepiles, M=land treatment, N=landfills, O=incinerators, P=thermal treatment, Q=biological treatment, R=underground injection, S-V=reserved for future use, W=drip pads, X-Z=reserved for future use, AA=process vents, BB= equipment leaks, CC=containers, DD=containment buildings, EE=munitions & explosives storage.

Explanatory Notes:
(a) * Prevalence = Percentage of all RCRA TSD units.
(b) Source: Prevalence percentages above based on a non-random sample of 100 TSDFs located in USEPA Region 4 (8 southeastern states), as reported in Revised Draft Report on Analysis of Cost Estimates for Closure and Post-Closure Care, by PRC Environmental Management Inc, for the USEPA Office of Solid Waste, 15 Oct 1996, Table 3, p.15.

II-B. What is the Universe of Eligible RCRA Waste Management Facilities?

Based on a 1999 estimate, there is a total of **866 TSFs** which represent the relevant universe of facilities potentially eligible to participate in the standardized RCRA permit program (after its finalization as a new rule), as summarized in Table 2 below.

Table 2: Estimated Universe of Eligible Facilities:
On-site TSFs Which Store and/or Non-Thermally Treat RCRA Hazardous Wastes
in Tank Systems, Containers, and/or Containment Buildings

Type of Eligible RCRA TSF Unit*	Permitted TSFs (40 CFR Part 264)	Interim Status TSFs (40 CFR Part 265)	Row totals
1. Containers	523	277	800
2. Tank Systems	379	244	623
3. Containment Buildings	6	16	22
Non-duplicative column totals	584	281	**866**

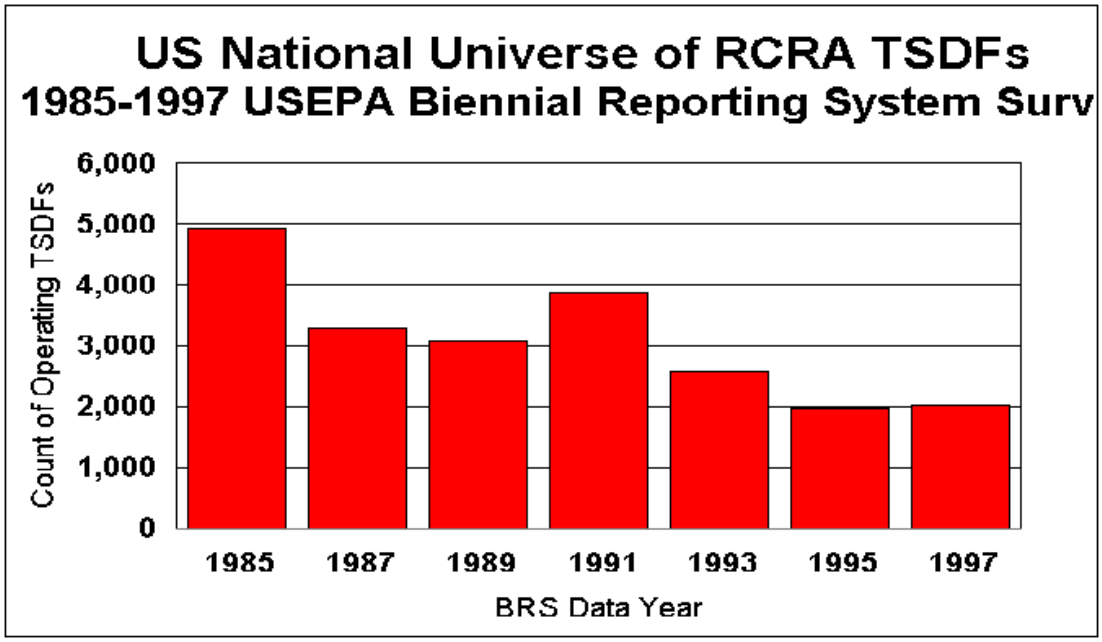
Explanatory Notes:
(a) Source: Table 1 in "Supporting Statement for Information Collection Request Nr.1935.01: Standardized Permit for RCRA Hazardous Waste Facilities", ICF Inc., 16 Nov 1999. Data are based on ICF Inc's analysis of the USEPA RCRA "Permitting Program Accomplishments Report" for the period 01 Oct 1980 to 04 Oct 1999, excluding Federally-owned TSFs. Query PPAR data at: http://www.epa.gov/oswfiles/rcraweb/web_reporting/permit.htm .
(b) * The number of eligible "units" (not shown) is larger than the number of eligible "facilities" shown in this table.

Compared to the 1997 RCRA TSDF universe of **2,025 facilities** (i.e. treatment, storage and disposal facilities), these 866 eligible facilities represent 43% of the universe. The universe of TSDFs has decreased since 1985 as shown in Table 3 below and the associated histogram.[7]

[7] The RCRA TSDF universe is enumerated in the USEPA's "Biennial Reporting System" (BRS). The BRS data are available over the Internet at http://www.epa.gov/epaoswer/hazwaste/data/br97/index.htm .

Table 3: 1985-1997 Universe of Active & RCRA-Permitted Industrial Hazardous Waste TSDFs in the USA - All Types of Units					
Row item	Data Year [a]	Treatment or Disposal	Storage Only	Total Count of TSDFs [c]	TSDFs Receiving Offsite Waste
1	1997 [b]	947	1,078	2,025	543
2	1995	900	1,083	1,983	644
3	1993	1,032	1,552	2,584	739
4	1991	1,203	2,659	3,862	794
5	1989	1,308	1,770	3,078	1,240
6	1987	. 1,687	. 1,620	3,308	969
7	1985	NA	NA	4,944	2,022

Explanatory Notes:
(a) Row item years displayed in this table correspond to the USEPA-OSW's "Biennial Reporting System" (BRS) data years, which began in 1981. The USEPA did not approve public distribution of both the 1981 and 1983 BRS survey findings because of data quality flaws. BRS reports for 1991 and subsequent years are available at http://www.epa.gov/epaoswer/hazwaste/data/index.htm#brs .
(b) The 1997 data year excludes wastewater TSDF data which was collected in prior data years, so comparisons and trend analysis using 1997 data may be inconsistent.
(c) A single TSD "facility" may operate more than one type of industrial hazardous waste TSD process/equipment "unit" at a single site; consequently the universe count of TSD "units" (not shown) exceeds the universe count of TSD "facilities" displayed in this table. For example, Table 2 of the ICR reference source "B" cited elsewhere in this background document indicates an average of 13 container "units" per RCRA-permitted container facility, and an average of 22 tank "units" per RCRA-permitted tank system facility.
(d) "NA" = data not available from USEPA national summary reports.



II-C. Which Industry Sectors Own & Operate Eligible TSFs?

Under USEPA's RCRA "cradle-to-grave" regulations, hazardous waste ***generators*** must determine if their waste is hazardous, and must oversee the ultimate fate of their waste. Hazardous waste generators include various types of facilities and businesses ranging from large manufacturing operations, universities, and hospitals, to small businesses and laboratories.

Depending upon a number of factors, generators may own and operate waste management units "***onsite***" (i.e. at the same location as the waste generation), and/or generators may transport some or all of their hazardous wastes to "***offsite***" waste management units, which may be owned and operated by other companies within or outside of the original generating industry sector. Consequently, the list of industry sectors which own and operate RCRA TSFs includes not only the commercial hazardous waste management service sector (i.e. SIC code 4953 & NAICS code 562), but also includes numerous other waste generating industry and economic sectors. [However by its design, "offsite" commercial TSFs are not eligible for RCRA standardized permits.] Table 4 displays the count of TSFs and associated WMUs which may be eligible for standardized RCRA permits, according to ten "***SIC code***" industry groupings.

Table 4: Industry Sectors Which Own & Operate Eligible Hazardous Waste TSFs:*
Count of TSFs and Associated Waste Management Units
(Note: some facilities designate multiple SIC codes, which result in duplicative counts below)

SIC	Industry Category Description	NAICS equivalent	Containers		Tank Systems		Containmnt Bldgs	
			Facilits	Units	Facilits	Units	Facilits	Units
0	Agriculture, Forestry & Fisheries	11	21	26	12	23	0	0
1	Mining, Oil/Gas & Construction	21,23	26	34	16	32	0	0
2	Manufacturing**	31-33,511	427	814	313	981	5	10
3	Manufacturing (continued)**	31-33	285	465	136	354	17	28
4	Transport, Communication, Utilities	22,48,49,513,562	272	678	201	877	10	12
5	Wholesale & Retail Trade	42,44,45	175	221	132	241	3	5
6	Finance, Insurance & Real Estate	52,53	5	7	2	3	0	0
7	Services***	71,72,512,514,811,812	221	437	183	421	2	2
8	Services (continued)***	54,55,561,61,62,813,814	90	256	38	177	0	0
9	Public Admin, Environment & NEC	92	200	508	85	288	4	14
		Non-duplicative column totals**** =	800		623		22	

Explanatory Notes:
(a) * Source: USEPA-OSW customized query of RCRIS and BRS databases (as of March 2000).
(b) SIC = "Standard Industrial Classification" system.
NAICS = "North American Industry Classification System", adopted by the US Federal Government in 1997, which replaced the SIC code system (for NAICS and SIC conversion tables, see http://www.census.gov/epcd/www/naics.html).
(c) ** SIC 2 Manufacturing = Food, Textile/Apparel, Lumber/Wood, Furniture/Fixtures, Paper, Printing/Publishing, Chemicals/Allied Products, & Petroleum/Coal.
(d) ** SIC 3 Manufacturing = Rubber/Plastic, Leather, Stone/Clay/Glass, Primary Metals, Fabricated Metals, Industrial Machinery, Electronics, Transportation Equipment, Instruments, & Misc. Mfrg.
(e) *** SIC 7 Services = Hotels, Personal, Automotive, Repair, Motion Pictures, & Recreation.
(f) *** SIC 8 Services = Health, Legal, Social, Museums/Gardens, Membership Organizations & Engineering/Mngmnt.
(g) **** Source: Table 2. Because some TSFs report multiple SIC codes for their operations, both the facility and unit total counts in this table exceed the non-duplicative total numbers of facilities as reported from Table 2.

II-D. What is the Purpose of a RCRA Permit?

In general, owners of hazardous waste TSDFs located in the USA are required to obtain Federal government permission to operate such facilities, in the form of a RCRA hazardous waste management unit ***operating permit***[8], for six basic purposes:

Authority:	Provide TSDF owners and operators with the legal authority to treat, store, or dispose of hazardous waste.
Standards:	Establish the administrative and technical conditions at the facility (i.e. waste management unit) level, under which waste at the TSDF must be managed.
Compliance:	Detail how TSDFs must comply with the regulations.
Protection:	Ensure that hazardous waste is handled in a controlled manner that is protective of human health and the environment.
Implementation:	Serve as a RCRA regulatory program implementation mechanism.
Tracking:	Serve as a means by which USEPA may track waste management at facilities that handle hazardous waste.

The USEPA views RCRA permits as ***living documents*** that can be modified to allow industrial waste management facilities to implement technological improvements, comply with new environmental standards, respond to changing wastestreams, and generally improve waste management practices.

There are also ***special types*** of RCRA hazardous waste operating permits (40 CFR 270 Subpart F) which provide flexibility to develop and apply permit conditions and procedures in unique circumstances, such as:

- Permits-by-rule (40 CFR 270.60)
- Emergency permits (40 CFR 270.61)
- Incinerator permits (40 CFR 270.62)
- Land treatment demonstration permits (40 CFR 270.63)
- Underground injection wells (40 CFR 270.64)
- Research, development & demonstration permits (40 CFR 270.65)
- Industrial boiler and furnace permits (40 CFR 270.66).

Such special RCRA permits are not within the scope of the standardized permit proposal.

II-E. What Types of Industrial Wastes Are Covered by RCRA Permits?

Under Congressional authority contained in Subtitle C (Section 3005) of the Resource Conservation and Recovery Act of 1976 (RCRA), the USEPA established a "hazardous" waste management ***operating permit***, for the treatment, storage, and disposal of industrial hazardous wastes identified or listed in 40 CFR Part 261. The permit describes the terms, conditions, and schedules of compliance, as well as monitoring, recordkeeping, and reporting requirements.

As listed below according to there associated generic wastecode, there are basically five

[8] Additional introductory information about RCRA permits is provided in the "RCRA, Superfund & EPCRA Hotline Training Module" (USEPA report nr. EPA-530-R-97-062; NTIS report nr. PB-98-108-178; Nov 1997, 25pp.), which is available to the public via the Internet at http://www.epa.gov/epaoswer/hotline/training/perm.pdf .

categories of RCRA ***hazardous industrial wastes***, as currently defined by the USEPA in the RCRA regulations (associated generic form of RCRA wastecodes in parentheses):

Dxxx: Wastes which exhibit one or more of three chemical characteristics:
- Ignitability (D001)
- Corrosivity (D002)
- Reactivity (D003)
- Toxicity (i.e. wastes which contain certain listed leachable chemicals. The 1999 CFR lists 40 chemical constituents as D004-D0043 wastecodes.)

Fxxx: Certain listed wastes generated by non-specific industrial sources. The 1999 CFR lists 28 Fxxx wastecodes.

Kxxx: Certain listed wastes generated by specific industrial sources. The 1999 CFR lists 121 Kxxx wastecodes.

Pxxx: Certain listed "acutely hazardous" discarded, off-spec, container or spill residues of commercial chemical products or manufacturing chemical intermediates. The 1999 CFR lists 239 Pxxx wastecodes.

Uxxx: Certain listed "toxic" discarded, off-spec, container or spill residues of commercial chemical products or manufacturing chemical intermediates. The 1999 CFR lists 475 Uxxx wastecodes.

Since the 1976 Congressional authorization for the RCRA hazardous waste listing program, the number of RCRA wastecodes in each of these five categories has grown over time, as the USEPA adds new "listings" to the RCRA regulations.

II-F. What Types of Hazardous Industrial Waste Management Activities Require RCRA Permits?

As defined in the USEPA's RCRA Subtitle C hazardous waste permitting program (40 CFR 270.1(c) & 270.2), owners and operators of hazardous waste management units which conduct any of the following three categories of waste handling activities, require RCRA operating permits. [When a TSF is operated by a different party than the owner, it is the operator's duty to obtain a permit, except that the owner must also sign the permit application; 40 CFR 270.10(b).] The USEPA/states currently review and issue these permits according to the particular waste management process to be permitted at an **individual site** (i.e. facility):

Treatment: Any method, technique, or process including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste, so as to neutralize such wastes, or so as to recover energy or material resources from the waste, or so as to render such waste non-hazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume. Treatment in totally enclosed treatment units (TETUs), elementary neutralization units (ENUs), and wastewater treatment units (WWTUs) are exempt from RCRA permitting. [*Note that only three types of non-thermal treatment units – using tanks, containers, and/or containment buildings – are eligible for standardized permits.*]

Storage:	Holding of hazardous waste for a temporary period exceeding ten days, at the end of which the hazardous waste is treated, disposed, or stored elsewhere. Temporary storage of a RCRA-manifested hazardous waste shipment for less than ten days before transfer is a "transfer facility", not subject to RCRA permitting standards. [*Note that only three types of storage units – using tanks, containers, and/or containment buildings – are eligible for standardized permits.*]
Disposal:	Intentional or unintentional discharge, deposit, injection, dumping, spilling, leaking, or placing of any hazardous waste into or on any land or water, so that such hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwater. A disposal unit (facility) is any site where hazardous waste is intentionally placed and where the waste will remain after a TSDF stops operation (i.e. discontinues receiving waste). [*Note that disposal units are not eligible for standardized permits.*]

These three activities apply to the overall scope of RCRA Subtitle C hazardous waste permits. The RCRA permit regulations also cite "specific inclusions" and "specific exclusions" as applied to particular types of waste management units and operations. For additional information about hazardous waste storage, treatment and disposal activities, see the USEPA Internet website http://www.epa.gov/epaoswer/osw/tsd.htm .

In comparison as explained in the Federal Register announcement, the standardized permit proposal only applies to two of these three general types of industrial waste management activities:

- **Storage** (three types only)
- **Treatment** (***non-thermal*** only)

From a design and engineering perspective, the storage and non-thermal treatment of waste in the three types of waste management units eligible for standardized permits (i.e. tank systems, containers and containment buildings) are generally less complicated than thermal treatment of waste (e.g. combustion of hazardous waste in incinerators, boilers, or industrial furnaces) or disposal of waste (e.g. placement in landfills). It is easier to control human health and environmental risks at these simpler storage and treatment units.

Furthermore, TSFs applying for standardized permits must meet RCRA clean closure regulations (or obtain conventional RCRA post-closure permits instead). Land disposal facilities (which are subject to post-closure care) are not eligible for standardized permits.

II-G. What are the Basic Components of a RCRA Permit?

The conventional RCRA permit application process consists of the following sequential steps:

Public meeting:	TSDF holds initial public meeting prior to submitting a permit application.
Permit application:	TSDF submits written ***Parts A and B*** of the permit application to *permitting authority* (i.e. to the USEPA and/or RCRA-authorized state agency).
Permit review:	Permitting authority and public review of submitted application;

permitting authority either issues a "***notice of deficiency***" if application is incomplete, or begins evaluation of the application to determine whether to issue or deny a permit. Under the conventional RCRA permit process, determination of completeness must be made within 60 days (40 CFR 124.3(c)).

Public comment: If application is satisfactory, permitting authority prepares a ***draft permit***, and opens a public comment period (and may hold public hearing if requested).

Final decision: Permitting authority responds to public comments and may revise the draft permit, and makes final permit decision by denying or issuing the permit. There is no time limit for final decisions under the conventional RCRA permit process. [*The standardized RCRA permit proposes to limit the entire review process to* ***120 days***.]

The elements and requirements of the RCRA Subtitle C hazardous waste permit program are described in 40 CFR 124 and 270:

40 CFR 124: Contains USEPA procedures for issuing, consolidating, modifying, revoking and reissuing, or terminating, and for public hearings/comments and reviewing, all RCRA (and three other USEPA types UIC, PSD and NPDES) permits. 40 CFR 124 contains six subparts, of which four subparts are applicable to RCRA permits (i.e. Subparts A, B, E, & F).

40 CFR 270: Regulations in 40 CFR 270 are targeted at only RCRA hazardous waste permits, and pertain to permit application requirements, TSDF technical requirements, TSDF permit conditions, and TSDF monitoring and reporting requirements under a permit. This Part also directs new TSDFs to comply with the technical standards in 40 CFR 264, whereas existing TSDFs – as of the effective date of regulatory amendments that render a facility subject to acquiring a RCRA permits (i.e. "interim status" TSDFs) -- are directed to comply with the technical standards in 40 CFR 265 (which are similar to those in Part 264).

With some exceptions (as listed at 40 CFR 270.1(c)(2)&(3)), owners and operators of hazardous waste management units (i.e. TSD facilities) must have RCRA permits during the active life (including closure period) of the unit (40 CFR 270.1(c)). RCRA permits may be issued by USEPA, authorized states[9], or both.

The ***permitting agency*** has the authority to issue or deny RCRA permits, and is responsible for

[9] **"Authorized state"** = State governments may be authorized by the USEPA to administer hazardous waste management programs (including the RCRA permit application review and approval process), in lieu of the Federal RCRA program. TSDF permit applicants must comply with the specific application requirements of such authorized states. State authorization is a rulemaking process through which USEPA delegates the primary responsibility of implementing the RCRA hazardous waste program to individual states in lieu of USEPA. This process ensures national consistency and minimum standards while providing flexibility to states in implementing rules. As of 1999, USEPA has granted 49 states and territories authority to implement the base or initial RCRA hazardous waste program. Many states are also authorized to implement additional parts of the RCRA program that the USEPA has since promulgated, such as Corrective Action and the Land Disposal Restrictions (LDRs). State RCRA programs must always be at least as stringent as Federal requirements, but states may adopt more stringent requirements as well. For more information about RCRA state authorization see http://www.epa.gov/epaoswer/hazwaste/state/index.htm .

verifying that facilities are operating in compliance with the conditions set forth in each permit. Owners and operators of TSDFs that do not comply with permit provisions are subject to possible RCRA enforcement actions, including financial penalties. RCRA permits are valid for a maximum duration of **ten years** (40 CFR 270.50(a)). As currently designed, a RCRA permit application consists of **two parts** (i.e. Parts A & B):

Part A:	Is submitted on a designated, structured **information form** (EPA Form 8700-23[10]), and requires basic information about the TSD facility, such as the name of the facility owner and operator, facility location, description and capacity of the hazardous waste management processes to be used, and specification of the types of hazardous wastes to be managed at the TSD facility (40 CFR 270.13).
Part B:	Is submitted in **written narrative style** (i.e. there is not a special USEPA form) and provides detailed, site-specific information associated with the waste management activities that will be conducted at the TSD facility, and includes geologic, hydrologic, and engineering data, and may consist of volumes of documents (40 CFR 270.14). Part B may be submitted voluntarily, however, an applicant is not required to submit it until it is requested by USEPA or an authorized state. Applicants have up to six months to submit Part B. New TSDFs must submit Parts A and B simultaneously at least six months prior to the new facility (or unit) construction start date.

Additional, descriptive information about the RCRA hazardous waste management permit program is available on the Internet http://www.epa.gov/epaoswer/hazwaste/permit/index.htm .

II-H. Are There Different Types of RCRA Permitting Actions?

Potential cost savings stem from expected reduction in average annual permitting resources for both the eligible universe of TSFs, and for USEPA/state agencies ("*permitting authorities*"), associated with TSFs preparing and with USEPA/states reviewing on an annual basis, four types of RCRA permitting actions:

New permit:	New permit applications from "interim status" and newly-constructed TSFs.
Modification:	Applications by existing TSFs for modifications to existing permits (defined according to 40 CFR 270.42 "classes"[11]):

[10] USEPA Form 8700 "Hazardous Waste Permit Application Part A" (7 pages), and its instructions (28 pages), are available over the Internet at http://www.epa.gov/epaoswer/hazwaste/data/form8700/forms.htm .

[11] The RCRA program defines three "***classes***" of permit modifications (40 CFR 270.42 Appendix I):

Class 1:	Cover **routine changes** to permits such as correcting typographical errors in the permit itself, or replacing equipment at a TSDF with functionally equivalent equipment.
Class 2:	Address **common or frequently occurring changes** needed to maintain a facility's level of safety or a TSDF's requirement to conform to new regulations, or increase of up to 25% in waste volume capacity.
Class 3:	Cover **major changes** that substantially alter the TSDF or its operations, such as >25% increase waste volume capacity.

- ***Routine*** changes (i.e. “class 1" or “class 2" permit modifications such as up to 25% increase in TSF capacity).

- ***Significant*** changes (i.e. “class 3" permit modifications, such as >25% increase in TSF capacity).

Renewal: Applications by existing TSFs for renewal (i.e. continuation) of existing permits upon expiration. Applications for permit renew must be submitted at least 180 days prior to expiration (40 CFR 270.10(h)).

Conversion: After its promulgation, the standardized RCRA permit is expected to induce some TSFs into submitting applications for conversion (i.e. switching) of conventional RCRA permits before expiration, to “standardized” permits. Possible benefit to TSFs of conversion is that subsequent permit modifications become less burdensome.

II-I. What is the Annual Frequency of RCRA Permitting Actions?

In conjunction with the different purposes to a RCRA permit action, a single waste treatment and storage ***facility*** (TSF) may have more than one permit action because of complimentary reasons:

- Within the facility’s operating lifetime, by extension (i.e. renewal) of its operating permit beyond the 10-year maximum duration permit period.

- Within a single year, by:

  - Permit modification, new permit or permit renewal involving multiple ***units*** located and operating within the same facility, each unit with its own RCRA permit.

  - Permit modification, new permit or permit renewal involving multiple RCRA wastecodes applicable to a single facility or unit within a facility.

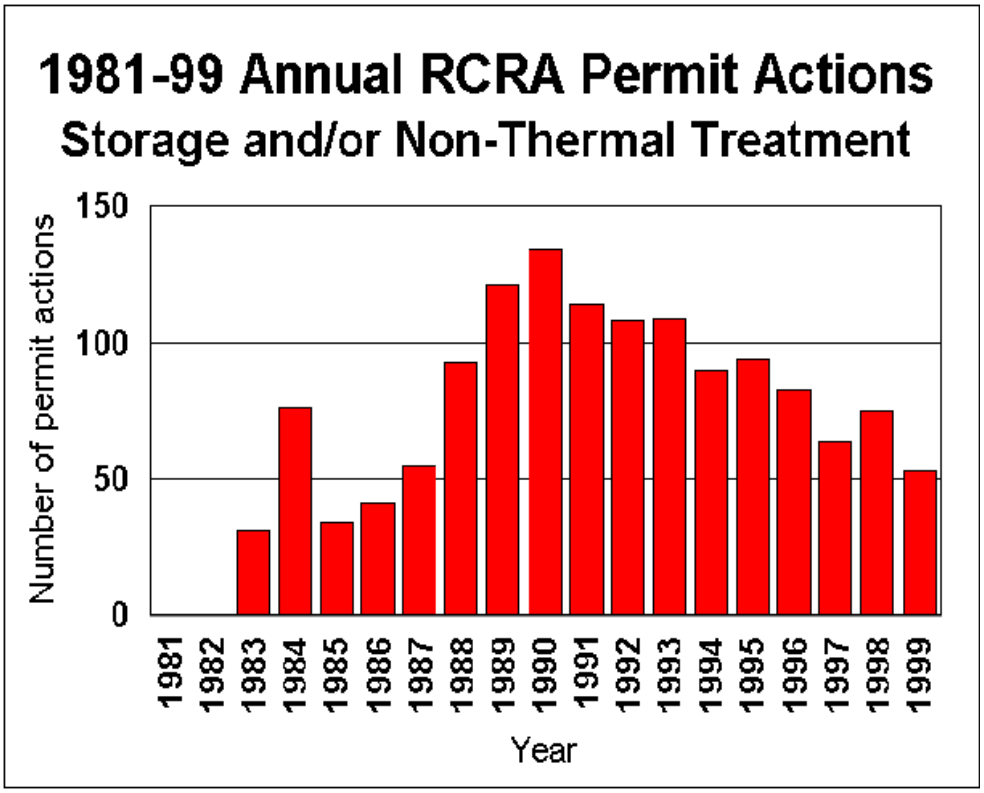
Table 5 and the associated histogram below present a summary over the history of the RCRA permitting program which dates back to 1980. Because RCRA permits once issued are valid for a fixed duration not to exceed ten years, permit renewal actions did not begin until the ninth year (i.e. FY1989) into the RCRA permit program.

As presented in the 01 July 1999 version of the CFR, the Appendix I permit modification class reference contains 12 examples for tanks, 9 examples for containers, and 11 examples for containment buildings, as summarized below:

Type of TSDF Unit	Class 1	Class 2	Class	Total
1. Tank systems	5	5	2	12
2. Containers	4	3	2	9
3. Containment	2	6	3	11
Column totals	11	14	7	32

Table 5: National Annual RCRA Permit Actions for 1981-1999: Hazardous Waste Storage and Non-Thermal Treatment Units			
Item	Fiscal Year*	Total permit determinations completed	Subtotal permit renewals
1	1981	0	0
2	1982	0	0
3	1983	31	0
4	1984	76	0
5	1985	34	0
6	1986	41	0
7	1987	55	0
8	1988	93	0
9	1989	121	5
10**	1990	134	11
11	1991	114	12
12	1992	108	22
13	1993	109	25
14	1994	90	33
15	1995	94	44
16	1996	83	52
17	1997	64	39
18	1998	75	47
19	1999	53	36
Column totals=		1,375	326
Annual averages:			
	All 19 years =	72.4	17.2
	Last 10 years =	92.4	32.1
	Last 5 years =	73.8	43.6
	Last 3 years =	64.0	40.7

Explanatory Notes:
(a) * Fiscal Year = 01 October prior to year shown, to 30 September of year shown.
(b) ** Because RCRA permits are valid for a maximum 10-year period, the annual pattern of permit actions exhibits a cyclical pattern, as evidenced by the increased level of actions in the timeseries data above around the tenth year in the RCRA permit program (i.e. FY1990), corresponding to permit renewal actions associated with the initial set of permits from 1980.
(c) Data source= "Permitting Program Accomplishments Reports" website:
http://www.epa.gov/oswfiles/rcraweb/web_reporting/permit.htm.
Data reflect historical "Permit Workload Universe" of 1,257 TSD facilities in the USA. which operated at least one storage and/or non-treatment unit.
(d) The RCRA TSDF operating permit program began in 1980, so FY1981 is first data year.


1981-99 Annual RCRA Permit Actions
Storage and/or Non-Thermal Treatment
Number of permit actions
150
100
50
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
Year

III. ECONOMIC ANALYSIS METHODOLOGY & RESULTS

III-A. What are the Potential Sources of Cost Savings Associated with a "Standardized" RCRA Permit?

The USEPA is proposing to add a new part to 40 CFR (i.e. **Part 267**) that specifies both the general facility and the unit-specific, streamlined requirements under the new standardized permit process. As described in the Federal Register announcement, in general, the conventional RCRA permit process – in comparison to the proposed "standardized" RCRA permit process – requires a relatively greater level of administrative resources for both TSFs and for USEPA/state for obtaining and maintaining RCRA industrial hazardous waste permits, such as involving:

- TSFs to prepare a much more detailed RCRA permit application.
- USEPA/states to conduct a more extensive permit application review.
- "Back-and-forth" between permit applicants and the USEPA or authorized states that normally takes place as both parties come to agreement on the completeness and accuracy of the permit application.

These requirements may impose a significant administrative workload to both TSFs and USEPA/state, and time delay. The standardized permit process proposes to streamline this permit **review activity**. The standardized permit process also proposes streamlined procedures for modifying standardized permits. However, it is important to emphasize that the standardized permit does not propose to reduce regulatory ***compliance*** **burden**. Consequently, any potential cost savings to TSFs and to USEPA/states relate only to **administrative paperwork burden** reductions, not to decreased levels of technical compliance burden. The scope of the cost savings assessment of this economic study is therefore limited to a quantitative assessment of the potential effect of standardized RCRA permits on administrative burden hours.

III-A.1. Qualitative Sources of Benefits Outside Scope of This Study:

As a type of streamlined permit, "standardized" RCRA permits may also provide eligible TSFs with additional and indirect benefits in the form of improved efficiencies to company **business planning** and **financial budgeting** activities. For example, one proposed feature of the standardized RCRA permit is a **120-day time limit** on the permit review/decision process, compared to no time-limit under the conventional RCRA permit process (only determination of permit application "completeness" by permitting authorities is subject to a 60-day limit under the conventional process (40 CFR 124.3(c))).

Although not quantified or otherwise documented in this study, this proposed time limit may conceivably provide eligible TSFs with increased certainty (i.e. decreased uncertainty) in the status and timely disposition of their permit applications, which may translate into the following **business risk management benefits** to eligible TSFs:

Business Budgeting:	Smaller annual company budget (cash flow) contingencies required for investment projects (less uncertainty requires less contingency). Increased company efficiency in allocating capital to investment projects, and in forecasting and timing company capital budget needs.

Business Planning:	Shortened company business planning period requiring less strategic company resources (e.g. less management and accounting personnel time spent in planning activities).
TSF Performance:	Increased technical and financial performance of TSF units from timelier (and possibly more frequent) waste management equipment and/or process modernization. Guaranteed turn-around time in permit actions may in effect lower the cost to eligible TSFs for unit modifications.

III-A.2. Sources of Administrative Cost Savings Included in This Study:

Because of its intentional ***streamlining*** design, the "standardized" permit is expected to provide net cost savings based on an incremental reduction in the administrative burden in comparison to existing (i.e. "conventional") RCRA permitting process, to **two parties**:

- Eligible RCRA TSFs.
- RCRA permitting authorities (i.e. USEPA regional offices and State offices).

The standardized permit proposal contains **three levels** of potential administrative cost savings to owners and operators of TSFs and to USEPA/states, consisting of **15 cost savings items** as listed in the Federal Register announcement (FR Tables 1, 3 and 4):

Permit application/review savings:	Of the **14 steps** listed under the conventional RCRA permit process (under 40 CFR 124 & 270), the standardized permit process proposes to drop **five** of these 14 steps (see Table 1 of the FR announcement for the proposal).
Permit provisions savings:	Of the **23 provisions** associated with the conventional permit process (i.e. under 40 CFR 270), the standardized permit process proposes to reduce the administrative burden of **four** of these 23 provisions (see Table 4 of the FR announcement).
Permit technical content savings:	Of the **24 technical**, general facility and unit-specific standards associated with conventional permits (i.e. 40 CFR 264), standardized permits reduce or eliminate **six** of these 24 technical standards (as described in the proposed new part 40 CFR 267); (see Table 3 of the FR announcement).

As listed in Table 6 below, compared to the requirements and administrative steps of the RCRA conventional permitting process, the "standardized" permitting process proposes to allow eligible TSDFs to either reduce or eliminate the following permit application requirements:

Table 6: List of 15 Administrative Requirements Either Reduced or Eliminated Under the "Standardized" RCRA Permit Proposal, Compared to the Conventional RCRA Permit Process					
Item	Source of Cost Savings [a]	Existing 40 CFR Permit Citation	Standard-ized Permit Change Proposed [b]	Cost Savings Beneficiary	
				TSF	Permit Authority
A. Permit Application/Review Cost Savings (5 items from FR Table 1):					
1	Public notice at Part B application submittal	124.32	Eliminate	X	
2	Review application for completeness	124.3	Eliminate		X
3	Issue notice of deficiency as necessary	124.3	Eliminate		X
4	TSF respond to notice of deficiency	124.3	Eliminate	X	
5	Determine application is complete	124.3	Eliminate		X
B. Permitting Provisions Cost Savings (4 items from FR Table 4):					
6	Permit application requirements	270.10	Modify	X	
7	Submittal & review of Part B permit application	270.1 [c]	Eliminate	X	X
8	Permit modification requirements	270.42	Modify	X	X
9	Permit renewal after expiration	270.51	Modify [d]	X	
C. Permit Technical Content Cost Savings (6 items[e] from FR Table 3):					
10	Construction quality assurance program	264.19	Not appl.[i]		
11	Manifests for wastes accepted from offsite	264.71	Not appl.[j]		
12	Groundwater monitoring (for detection, compliance, corrective action)	264.97-100	Not appl.[k]		
13	Closure plan requirements:				
13a	Submit closure plan [f]	264.112	Defer	X	X
13b	Submit closure cost estimate	264.142	Modify	X	X
13c	Closure financial assurance [g]	264.143	Modify		
14	Post-closure requirements: [h]				
14a	Post-closure plan	264.118	Not appl [l]		
14b	Post-closure cost estimate	264.144	Not appl [l]		
14c	Post-closure financial assurance	264.145	Not appl [l]		
14d	Post-closure notices (land zoning & deed)	264.119	Not appl [l]		
14e	Post-closure certification of completion	264.120	Not appl [l]		
15	Financial assurance for non-sudden liability	264.147b	Not appl [l]		

Explanatory Notes:
(a) Source: Cost savings items based on Tables 1, 3, and 4 of the preamble to the Federal Register (FR) announcement of the proposal.
(b) The USEPA will provide the streamlined technical requirements of the proposed RCRA "standardized" permit, once finalized and promulgated, as a new part of the CFR (i.e. as 40 CFR Part 267, which will be comparable in scope to Part 264 for conventional permits), and modify the corresponding sections of 40 CFR 124 and 270 to reflect standardized permit procedural and provision changes.
(c) Part B must still be completed but may be kept on-site with the TSF; 40 CFR 270.1 contains the existing requirement that TSFs must submit Part B of the permit application, however the contents of Part B are contained in 40 CFR 270.14 to 270.28.
(d) Although the renewal process remains unchanged, burden hours assigned to TSFs for renewal are reduced according to the same reduction in new permit hours (item 6), because renewal is identical to a new permit application.
(e) It is important to indicate that this table does not include all proposed changes to the regulations under the "standardized" permit process; for example, other technical changes include:
(1) Making 40 CFR 264.97 correction action requirements more flexible.
(2) "Variance" not allowed from tank system secondary containment (40 CFR 264.193(g)).
(3) 60-day limit for compensating pay-in to underfunded closure trust fund upon receipt of standardized permit.
(f) TSF closure plans may be submitted six months prior to closure date under a standardized permit, rather than at the date of the initial permit application as required for conventional permits.
(g) The FR preamble to the standardized permit proposal describes three changes to closure financial assurance:
(1) Specifies the shorter of the remaining TSF lifespan or a 3-year pay-in period for trustfunds, rather than the lifespan or the 10-year life of a RCRA permit (40 CFR 264.143(a)(3)).
(2) Revise the financial test ratio of total liabilities:to:total worth, from <2.0, to <1.5 (40 CFR 264.143(f)).
(3) Allow flexibility for the chief financial officer's letter, rather than prescribed language (40 CFR 264.151(f)).
(h) Clean closure required under standardized permit, as already required for containers under a conventional permit (40 CFR 264.178).
(i) The construction quality assurance program requirement (40 CFR 264.19) under the existing conventional RCRA permit is not applicable to RCRA standardized permits, because this requirement is only applicable to surface impoundments, wastepiles and landfills, types of units which are not eligible for standardized permits.
(j) The use of manifest systems for accepting wastes from off-site (40 CFR 264.73) is not applicable to RCRA standardized permits, because only on-site TSF units are eligible for standardized permits.
(k) Existing RCRA groundwater monitoring requirements (40 CFR 264.97-100) are only applicable to land-based units (i.e. land treatment units, landfills, surface impoundments, and wastepiles).
(l) Existing RCRA post-closure requirements (40 CFR 264.118-120), and non-sudden liability (40 CFR 264.147(b)), are only applicable to land-based disposal units which are not eligible for standardized permits.

The above itemized administrative streamlining features constitute the primary sources of cost savings -- in comparison and incremental to the current RCRA conventional permitting process -- which are quantified and monetized in this document below.

For purpose of consistency with the description of the standardized permit proposal contained in the preamble of the Federal Register (FR) announcement, there are three additional changes to the RCRA permitting process and possible associated regulatory options discussed in the FR preamble, which are not presented as separate line items in this background document. These changes have been omitted from the cost savings assessment of this study, because they provide relatively minor or negligible effects on burden hours, as described below:

Closure plan	Eligible TSFs may delay providing a facility closure plan until six months (180 days) prior to closure, rather than initially with the permit application. Compared to the average burden to TSFs for conventional RCRA permits of about 21 hours and $1,128 in labor cost (ICR reference "Source B"), the cost savings will be the time-discounted difference over the facility lifespan (e.g. 10, 20 or 30 years) of this expenditure, which is estimated in **Attachment B-6** at the end of this document as about $2,000 in savings for the expected average annual two new TSFs eligible for standardized permits. This minimal effect is excluded from the cost savings totals presented at the end of this document.
Closure cost estimate	• Do not need to base the facility closure cost estimate on a **closure plan**, because the plan may be deferred into the future. • The FR preamble to the standardized permit proposal introduces six alternative but optional **cost estimation methods** for public comment. The effects of these two changes on the average closure cost estimation burden to TSFs for conventional RCRA permits of 10 hours and

$528 in labor cost (ICR reference "Source B") is expected to be minimal. However, the potential benefits to permitting authorities may include improved and more uniform closure cost estimates across state permit programs. Improvements in cost estimation provided by these methods may provide: (a) more accurate closure cost estimates, thereby improving the efficiency of closure financial assurance pay-in schedules; (b) reduced transfer of TSF closure costs to public funds in event of TSF bankruptcies at closure.

Closure financial assurance

- Specifies the shorter of the remaining TSF lifespan or a 3-year **pay-in period**, rather than the lifespan or the 10-year life of a RCRA permit (40 CFR 264.143(a)(3)).

Attachments B-7 and B-8 present a comparison using low-end, medium and high-end closure costs of $13,000, $565,000 and $37.0 million. At a 7.0% discount rate, the shorter pay-in period results in direct funding cost savings under the medium case of about $2,000. However, this savings is not included in this study because (a) only two new facility permits per year are expected during the 30-year POA, and (b) only 12% of TSFs use a trustfund mechanism.[12]

- Revises the **financial test (and corporate guarantee) ratio** for of total liabilities:to:total worth, from <2.0, to <1.5 (40 CFR 264.143(f)).

This change is expected to reduce bankruptcy at closure. Although the financial test and corporate guarantee are used by 45% of TSDFs, bankruptcy occurs in only 1% of TSDF closure cases (based on the USEPA Region 4 1996 study of 100 TSDFs). Consequently, closure payment transfer benefits in the form of avoided bankruptcy cases may be minimal.

- Relaxes the financial test **special report** requirement from independent certified public accountant (40 CFR 264.143(f)(3)(i)).

Possible cost savings is estimated at 4.0 burden hours ($247) for such CPA report (assumed same as CFO letter cost in ICR "Source C" Exh.8). If applied to 45% of the average annual two new RCRA permit actions over a 30-year period (2001 to 2030), produces a discounted average annual cost savings estimate of about $240 (see **Attachment B-9**).

- Allows flexibility for the **chief financial officer's letter** (4.0 burden hours at $247 in cost, ICR "Source C" Exhibit.8), for the financial test and

[12] According to the 1996 USEPA study "Revised Draft Report on Analysis of Cost Estimates for Closure and Post-Closure Care", involving a non-random sample of 100 TSDFs located in USEPA Region 4, TSDFs use the following eight types of financial assurance mechanisms (Contract nr. 68-W4-0007, WA nr. R11007, PRC Environmental Management Inc., 15 Oct 1996, Table 2, p.10):

Financial Mechanism	% of TSDFs	Financial Mechanism	% of TSDFs
1. Financial test	35%	5. Insurance	5%
2. Letters of credit	30%	6. Surety bonds	4%
3. Trust funds	12%	7. State mechanisms	3%
4. Corporate guarantee	10%	8. Bankruptcy (no mechanism)	1%

corporate guarantee, rather than use prescribed CFR language (40 CFR 264.151(f)). The possible advantage provided in letter authorship flexibility to some CFOs, is assumed in this analysis as offsetting the possible disadvantage to some CFOs in adapting letter language provided in the CFR.

Corrective action

Provides three expedited corrective action determination options:

- **Incorporation by reference** (i.e. incorporate non-RCRA state cleanup conditions upfront into the new standardized permit). No net effect on permitting agency burden hours anticipated.

- **Postponement** (i.e. include permit provisions to postpone corrective action determination until completion of non-RCRA cleanup program, whereby permit is modified to reflect cleanup adequacy or inadequacy determination). The possible benefit is the time-discounted value of postponing corrective action determination from upfront at time of permit application, to a later year. This time-discounting effect is expected to be relatively minor in aggregate (national) magnitude – particularly when applied to the relatively small number of two future projected eligible (new) permits annually – and is not estimated in this study.

- **Deferral** (i.e. allow RCRA permitting authorities upfront to defer completely corrective action conditions in a standardized permit to a non-RCRA cleanup program). No net effect on permitting agency burden hours anticipated.

III-B. How Are National Cost Savings Estimated in this Document?

This study defines potential national cost savings as the ***incremental* difference** between national annual administrative cost (i.e. paperwork and recordkeeping burden) associated with the conventional RCRA permits program, compared to administrative burden cost associated with the proposed standardized RCRA permits program. Because the standardized RCRA permit is **voluntary** (i.e. not a Federal mandate), national savings also depends on the ultimate number of RCRA ***authorized states*** which implement this program after its finalization.

III-B.1. Information & Data Reference Sources:

For the purpose of formulating an estimate of potential cost savings, this document makes use of *secondary sources*[13] of quantitative information contained in USEPA "**Information Collection Request**"[14]

[13] A "***secondary source***" is data and information which another person or organization has observed, gathered, measured, researched, analyzed, and/or compiled for purposes other than the study at hand. In comparison, a "***primary source***" of data and information represents direct, original and personal involvement and connection to the data and information gathering and analysis for the study at hand. The use of "*secondary data*" in this background document serves constructively not only to save time and money in making use of available (i.e. secondary) data rather than collection of original (i.e. primary) data, but it also serves to provide analytic consistency with the Federal ICR burden accounting system.

[14] Under the 1995 Paperwork Reduction Act (44 USC Chapter 35; see http://www.nara.gov/fedreg/legal/), any Federal Government entity must obtain an approval from the Office of Management and Budget (OMB) to collect any information from the public. If an agency such as the USEPA decides to collect information, it must prepare an "**Information**

(ICR) documents. In general, USEPA ICRs contain quantitative estimates of the:

Affected entities:	Number of potentially affected **entities** associated with a regulatory action.
Burden hours:	Estimate of the **burden hours** to affected entities associated with a regulatory action.
Burden costs:	Estimate of the associated burden hour **dollar costs** to affected entities.

This background document references three USEPA ICRs dated 1999; two ICRs which were updated in 1999 related to the conventional RCRA permitting process, and a new (1999) ICR developed specifically in support of the "standardized" RCRA permit proposal:

Source A:	USEPA "Supporting Statement for EPA Information Collection Request Nr. 262.09: RCRA Hazardous Waste Permit Application and Modification, **Part A**", (Office of Solid Waste), 22 October 1999.
Source B:	USEPA "Supporting Statement for EPA Information Collection Request Nr. 1573: **Part B** Permit Application, Permit Modifications, and Special Permits", (Office of Solid Waste), 27 October 1999.
Source C:	USEPA "Supporting Statement for Information Collection Request Nr. 1935.01: **Standardized Permit** for RCRA Hazardous Waste Management Facilities", (Office of Solid Waste), 16 November 1999. It is important to explain how this particular ICR and this "Economics Background Document" differ in their respective study frameworks and conclusions. The purpose of this reference ICR was to estimate the *total* annual burden hours and *cost* to affected entities (i.e. eligible TSFs + permitting authorities) under the proposed standardized RCRA permits rule, whereas the purpose of this "Economics Background Document" was to

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Collection Request" (ICR) and submit it for OMB approval. An ICR explains what information will be collected, why the information is needed, who will need to respond, and gives an estimate of the burden hours (and of the burden cost in dollars) the public will incur to get and report the requested information. After reviewing an ICR, OMB may disapprove, approve, or place conditions which must be met for approving the ICR. The ICR process was designed to ensure that unnecessary collections are not conducted and that the public burden for approved collections is minimized.

According to both the 1995 PRA and to OMB's implementing regulations (5 CFR Part 1320), Federal government agencies are to measure ***paperwork burden*** to affected individuals, households, businesses, and organizations, in terms of the time and financial resources the public devotes annually to meet one-time and recurring Federal information requests. The term "burden" means the "time, effort, or financial resources" the public expends to provide information to or for a Federal agency, or otherwise fulfill statutory or regulatory requirements. For a list of Federal agency ICRs under review by OMB see the website: http://www.whitehouse.gov/library/omb/OMBPPRWK.HTM . For descriptive information and answers to frequently asked questions about ICRs, visit USEPA's ICR website: http://www.epa.gov/opperid1/index.htm .

In 1999 OMB initiated a preliminary reevaluation of its guidance to agencies on estimating and reporting paperwork burden. As part of this effort, OMB seeks comment on how to increase the uniformity, accuracy, and comprehensiveness of agency burden measurement (see http://www.whitehouse.gov/OMB/fedreg/5cfr1320.html).

estimate the ***incremental change*** in annual burden hours and associated burden cost, relative to the baseline (i.e. conventional) RCRA permitting program. [Because of its intentional ***streamlining design***, the *a priori* expected incremental net change is reduction in permit burden.]

Consequently, because of these two different study frameworks, the reference ICR concluded that the proposed standardized permit would results in **24,593 annual burden hours** and **$1.846 million** in associated labor annual costs, whereas this document provides an incremental net decrease (i.e. savings) in annual burden hour and associated labor cost.

Currently, Federal agencies separately estimate the "***burden hour***" and "***burden cost***" of each particular information collection. This ensures that all types of paperwork and administrative burden are taken into account, but requires two calculations of burden, one in the form of "burden hours" and the other in the form of "dollars". Consequently, this document also presents two separate, respective estimates of cost savings in the form of both annual burden hour reduction and annual burden cost reduction associated with the standardized permit proposal.

In addition to these three ICRs, this document also references the preamble of the USEPA Office of Solid Waste's Federal Register announcement for the RCRA standardized permit proposal, and the US Code of Federal Regulations (CFR), for descriptive information about permitting requirements under the "standardized" permit proposal and under the conventional RCRA permit process, respectively.

III-B.2. National Cost Savings Estimation Methodology:

USEPA estimated potential cost savings by applying the following **four-step estimation method**:

Step 1: **Itemized burden hours**: Using burden hour data from the reference documents "Source A", "Source B" and "Source C" listed above, this first step estimated the expected change in burden hours separately to both eligible TSFs and to permitting authorities, associated with the 15 potential items of cost savings as identified in Table 6 above in this document (also see **Attachment A-1**).

Table 8 below presents the results of this first step. Burden hour entries in Table 8 with a "+" indicate an incremental burden cost increase relative to the conventional RCRA permit baseline burden hours, and unit hour entries with "-" indicate burden cost savings.

Changes in burden hours are assumed in this study to occur completely within the year of the permit action, because of the **120-day decision time limit** for permitting authorities as proposed under the standardized permit.

Step 2: **Burden hour subtotals**: The second step involved computing respective burden hour change subtotals assigned to each of the:

- Three types of eligible TSF units (i.e. containers, tank systems, and containment buildings), and
- Four types of RCRA permitting actions (i.e. renewals, conversions, new permits, and modifications).

Table 9 below separately displays the results of this step for eligible TSFs, for permitting authorities, and combined (i.e. TSFs + permitting authorities). (Also see top-half of **Attachment A-2**).

Step 3: **Burden hour monetization**: The respective burden hour reduction assumptions and burden hour subtotals generated in Steps 1 and 2, were monetized into dollar values on a "*per permit action*" basis, by multiplying burden hours with the 1999 overhead-loaded, hourly labor wage rates ($ per hour) shown in Table 7 below:

Table 7: Labor Costs Applied for Monetizing Burden Hours (Overhead-Loaded Average Hourly Cost)

Affected Personnel	Labor Category ($/hour)			
	Legal	Mngrl	Tech	Clerical
Eligible TSFs	$102	$73	$53	$27
Permit authorities	$61	$57	$42	$17

Source: USEPA-OSW, "Supporting Statement for Information Collection Request Nr. 1935.01: Standardized Permit for RCRA Hazardous Waste Management Facilities", 16 Nov 1999, Sections 6b & 6c respectively (i.e. ICR "Source C"). "Loaded" costs above are not intended to double-count clerical in overhead.

The results of this monetization step are presented in Tables 10, separately for eligible TSFs, for permitting authorities, and combined (also see bottom of **Attachment A-2**).

Step 4: **Annual burden reduction**: This step involved the multiplication of the monetary (dollar) value of burden hour subtotals per permit action generated in Step 3 (displayed in Table 10), times the respective future annual nationwide frequency of permit actions shown in Table 11 (arrayed in **Attachment B-1**) associated with:

- Four types of permit actions.
- Three types of eligible TSF units.

Future permit actions and associated burden reduction cost savings are arrayed (see **Attachments B-2, B-3, B-4**) according to a ***consequence flow diagram*** or schedule, consisting of two timeline elements:

- "***Baseyear***": defined in this study as the year **2001** which represents the possible earliest start year for standardized RCRA permits after rule promulgation, used to represent the first year of the cost savings analysis.

- "***Period-of-analysis***": defined in this study as the 30-year period **2001 to 2030**, which represents a medium-term POA. A ***sensitivity analysis*** at the end of this study present results according to alternative POAs (i.e. 10- and 20-years).[15]

[15] The "***period-of-analysis***" (POA) is the timespan over which the economic effects of a project, program, activity, equipment will be evaluated. The POA may also be called the "***study period***" or "***planning horizon***". POAs have different possible working definitions, and the length

- "***Constant dollar***" valuation: The monetary values of future annual burden hour reductions over the POA (i.e. future cost savings stream), are valued in constant dollars (often called "*real*" dollars or constant "*purchasing power*"), not in inflated dollars. This practice is consistent with economic analysis principles. "Constant dollars" are usually defined according to the price levels corresponding to the year in which an economic study is conducted (in this case, constant dollar values correspond to the 1999$ ICR reference labor wage data). [In contrast, "*nominal*", "*current*" or "*actual*" dollar valuation is based on future price levels and is often applied for financial or cash-flow analysis. The ***sensitivity analysis*** at the end of this document presents the effect of future price inflation on estimated cost savings.]

Attachments B-2, B-3 and B-4 at the end of this document present the respective estimated cost savings (i.e. combined savings, TSFs savings only, and permitting authorities savings only). Each of these three attachments present three complementary measures (i.e. ***metrics***) of estimated cost savings over the 30-year POA:

- ***Non-discounted total*** savings over the POA.
- Discounted "***net present value***" (NPV) of POA savings.
- Discounted "***average annual equivalent***" (AAE) of POA savings.

The NPV and AAE cost savings measures follow the cash flow equivalence computation technique generally known as the "***Equivalent Uniform Annual Cost***" (EUAC) method.[16] For the two discounted cost savings measures, the OMB prescribed ***discount rate*** for Federal

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of a particular POA may be determined in several ways. For example, POAs may be defined as either the:

- "***Technical life***" (i.e. the potential "operating life" or "engineering life" that a normally operated and maintained project will continue to function; or
- "***Economic life***" (i.e. sometimes also called the "required service period", "useful life", or "project life" which represent the time period over which society experiences either benefits or costs of a project).

Economic life may be the same or less than *technical life*, but never greater. In the case of comparison of multiple project alternatives, a "lowest common multiple" POA is appropriate so that project comparisons are made using equal POA timespans. POAs may also be defined as a matter as policy; for example, it is Federal policy to use a 50-year POA in the economic analysis of most water resource projects although a 100-year POA may be used for large, multi-purpose and major long-term water resource projects (US Army Corps of Engineers, Engineering Regulation ER1105-2-100, 28 Dec 1990, p.5-9). OMB's Federal regulatory economic analysis guidelines do not specify any particular required or alternative POAs, although OMB does identify two potential candidate POA reference periods for Federal acquisition of capital assets: (a) life cycle cost POA and (b) economic life POA (source: OMB, Circular Nr. A-94, 29 Oct 1992, p.16, http://www.whitehouse.gov/OMB/circulars/a094/a094.html). The 30-year POA applied in this study represents a "***medium-term***" POA, as compared to a 20-year "***short-term***" POA and a 50-year "***long-term***" POA, as defined by the USEPA in "Supplemental Appendix C" (pp.7,8) to its March 1991 reprinted "Guidelines for Preparing Regulatory Impact Analysis", Office of Policy, Planning & Evaluation, (which are undergoing revision in 1999).

[16] The "EUAC" **economic equivalence** and **consequences flow method** using the analytical method of time-value "***discounting***", is described in numerous engineering economics textbooks, such as in H.M. Steiner, Public and Private Investments: Socioeconomic Analysis, Books Associates, Washington DC, 1980.

regulatory analyses of **7.00%** was applied.[17] The purpose of "***discounting***" over the future POA is to convert cash flows which occur at different points over time, into ***economic equivalence*** values relative to a single base year.

Table 11 below presents the estimated **future average annual frequency** of the four types of RCRA permitting actions, as expected to apply to eligible TSFs. **Attachment B-1** arrays these annual actions according to the 30-year POA. This future average frequency is a borrowed working assumption in this economic analysis from ICR "Source C". (Note that Section IV of this document presents a ***sensitivity analysis*** of cost savings to alternative non-constant, future permit action frequencies).

Table 12 below summarizes the AAE results of this step separately for both eligible TSFs and for permitting authorities, as well as on combined national cost savings basis (i.e.eligible TSFs + permitting authorities).

III-C. What Are the Results of the National Cost Savings Estimation?

The following six tables (i.e. Tables 8 to 12) display the respective data and computational elements, assigned numerical values, and results for each step of the cost savings estimation method described above:

[17] In Section III.A.3 of its "Economic Analysis of Federal Regulations Under Executive Order 12866" (11 January 1996), the US Office of Management and Budget (OMB) directs Federal regulatory agencies such as the USEPA to apply a **7.00% discount rate** to economic analyses of the benefits and costs of Federal regulations (see OMB's website at http://www.whitehouse.gov/OMB/riaguide.html). This discount rate is prescribed by OMB in its "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs", Circular Nr. A-94, Revised Transmittal Memorandum Nr. 64, 29 October 1992, 26pp.(http://www.whitehouse.gov/OMB/circulars/a094/a094.html).

Executive Order (EO) 12866 "Regulatory Planning and Review" (30 September 1993) contains a statement of philosophy, principles, procedures, guidelines and a planning mechanism, for Federal regulatory agencies to follow during the development, evaluation, selection and finalization (i.e. promulgation) of **"*significant*" regulatory actions**. EO12866 applies to all existing regulations, as well as to new proposed and to new final Federal regulatory actions. Section 3(f) of EO-12866 defines "*significant*" regulatory actions as any action which may result in a rule that may:

- Have an annual [adverse] effect on the economy of $100 million or more (or other material effect).
- Create a serious inconsistency or otherwise interfere with another Federal agency.
- Materially alter the budgetary impact of Federal entitlements, grants, user fees, or loan programs.
- Raise novel legal or policy issues.

For "significant" regulations (particularly those with >$100 million in effect), both EO-12866 and OMB's guidance prescribe special required regulatory development procedures and economic analysis requirements. As explained in the preamble to the Federal Register announcement, the USEPA has designated the RCRA "standardized" permit proposal as a "significant" regulatory action because it raises novel legal or policy issues arising out of legal mandates (i.e. per the fourth definition above). However, because of the facts that the "standardized" permit: (a) is voluntary for eligible entities and state permitting authorities, (b) will not impose up-front increased costs on eligible entities relative to the conventional RCRA permit baseline, and (c) is deregulatory in that it will provide net benefits to eligible entities in the form of cost savings, the USEPA has not conducted a formal "Economic Assessment".

Table 8: Change in Administrative Burden Hours per RCRA Permit Action Under the RCRA "Standardized" Permit Proposal											
		Eligible TSFs (hours)					Permitting Authorities (hours)				
Item	Existing 40 CFR citation	Leg	Mgr	Tech	Cler	Sub-total	Leg	Mgr	Tech	Cler	Sub-total
A. Permit Application/Review:											
1	124.32	0	-0.25	-1.00	-0.25	-1.50					
2	124.3						0	0	-3.00	-0.25	-3.25
3	124.3						0	0	-0.50	-0.10	-0.60
4	124.3	0	-0.50	-2.00	-1.00	-3.50					
5	124.3						0	0	-0.75	0	-0.75
					A. subtotal=	-5.0					-4.6
B. Permitting Provisions:											
6	270.10	-1.0	+0.50	-0.50	0	-1.00					
7	270.1 cnt	0	0	0	-7.50	-7.50	0	-1.75	-52.75	-4.20	-58.70
	270.1 tnk						0	-1.75	-62.75	-4.20	-68.70
	270.1 bld						0	-1.75	-108.75	-4.20	-112.70
8*	270.42 (R)	0	0	-2.00	-0.10	-2.10	0	0	0	0	0
	270.42 (S)	0	-0.75	-6.00	-1.35	-8.10	0	0	0	0	0
9	270.51	-1.0	+0.50	-0.50	0	-1.00					
					B. subtotals**=	-19.7					-80.0
C. Permit Technical Content:											
10	264.19	No savings - this technical requirement does not apply to units eligible for standardized permits.									
11	264.71	No savings - this technical requirement does not apply to units eligible for standardized permits.									
12	264.97-100	No savings - this technical requirement does not apply to units eligible for standardized permits.									
13a	264.112	No savings because closure cost est. must still be submitted initially, even though plan is deferred.									
13b	264.142	0	-0.75	-7.75	-1.00	-9.50	0	0	0	0	0
13c	264.143	Revised closure financial assurance test affects the number of eligible TSFs, not permit cost.									
14a	264.118	No savings - this technical requirement does not apply to units eligible for standardized permits.									
14b	264.144	No savings - this technical requirement does not apply to units eligible for standardized permits.									
14c	264.145	No savings - this technical requirement does not apply to units eligible for standardized permits.									
14d	264.119	No savings - this technical requirement does not apply to units eligible for standardized permits.									
14e	264.120	No savings - this technical requirement does not apply to units eligible for standardized permits.									
15	264.147b	No savings - this technical requirement does not apply to units eligible for standardized permits.									
					C. subtotals=	-9.5					0
					Grand totals*** =	**-34.2**					**-84.6**

Explanatory Notes:
(a) Leg=legal; Mgr=managerial; Tech=technical; Cler=clerical. R=routine (class 1 or 2); S=significant (class 3).
(b) Zero ("0") hours indicate either that: (1) a particular labor category assumed not involved in a particular permitting activity, or (2) there is no incremental difference relative to hours assumed under the conventional RCRA permit process baseline.
(c) Plus ("+") hours indicate an incremental increase in unit hours assumed relative to the conventional permit process.
(d) Shaded cells indicate that the particular administrative savings item does not apply to one of the two parties.
(e) * Item 8 above split to reflect different unit hour assumptions for class 1 or class 2 "routine" (R), and for class 3 "significant" (S) permit modifications. (Only class 1 burden data used for "routine", and Class 3 burden data for "significant".)
(f) Although permit renewal process (item 9) remains unchanged, burden hours changed according to the same reduction in new permit hours (item 6), because the renewal process remains identical to a new permit application (270.51(a)(1)).
(g) ** B. subtotal represents average of Item 7 between containers, tank systems, containment buildings.
(h) Because comparison of the respective ICR reference data for items 8 and 9 are inconsistent, activities under both IP and SP assumed similar burden, so zero hours assigned above.
(i) *** Grand total unit hours shown do not strictly apply to every permit action (e.g. both routine and significant permit modifications from item 8 are included in grand total); grand totals are computed here for use as a general benchmark.
(j) Data source: See the supplemental spreadsheet provided as an Attachment at the end of this document for identification of data sources and explanation of unit hour assumptions.

Table 9: Changes in Burden Hours Per Permit Action,
Sub-totaled by Type of Eligible TSF Unit, and by Type of Permit Action

Type of Eligible RCRA TSF Unit	Type of RCRA Permit Action					
			New permits		Modifications	
	Re-newals	Conver-sions	New TSFs	Interim status	Routine (1or2)	Significant (class 3)
A. Unit Hour Reduction to **Eligible TSFs**:						
1. Containers	-23.0	+4.5	-23.0	-23.0	-2.1	-8.1
2. Tank Systems	-23.0	+4.5	-23.0	-23.0	-2.1	-8.1
3. Containment Bldgs	-23.0	+4.5	-23.0	-23.0	-2.1	-8.1
B. Unit Hour Reduction to **Permitting Authorities (i.e. USEPA/states)**:						
1. Containers	-63.3	+1.25	-63.3	-63.3	0	0
2. Tank Systems	-73.3	+1.25	-73.3	-73.3	0	0
3. Containment Bldgs	-117.3	+1.25	-117.3	-117.3	0	0
C. Unit Hour Reduction **Combined** (i.e. TSFs + Authorities):						
1. Containers	-86.3	+5.75	-86.3	-86.3	-2.1	-8.1
2. Tank Systems	-96.3	+5.75	-96.3	-96.3	-2.1	-8.1
3. Containment Bldgs	-140.3	+5.75	-140.3	-140.3	-2.1	-8.1

Explanatory Notes:
(a) Burden hours are incremental to the conventional RCRA permit process baseline (see **Attachments A-1 & A-2**).
(b) Conversion incrementally increase ("+") rather than reduce ("-") TSF and permitting authority burden, because conversions to "standardized" permits would not occur under the conventional RCRA permitting process baseline.
(c) Interim status hours assumed similar to renewal burden, as assumed in ICR "Source C".

Table 10: Monetized (Dollar) Value of Changes in Burden Hours Per RCRA Permit Action Sub-totaled by Type of Eligible TSF Unit, and by Type of Permit Action						
	Type of RCRA Permit Action					
			New permits		Modifications	
Type of Eligible RCRA TSF Unit	Re-newals	Conver-sions	New TSFs	Interim status	Routine (1or2)	Significant (class 3)
A. Burden Hour Reduction to **Eligible TSFs**:						
1. Containers	-$1,035	+$459	-$1,035	-$1,035	-$109	-$409
2. Tank Systems	-$1,035	+$459	-$1,035	-$1,035	-$109	-$409
3. Containment Bldgs	-$1,035	+$459	-$1,035	-$1,035	-$109	-$409
B. Burden Hour Reduction to **Permitting Authorities**:						
1. Containers	-$2,571	+$56	-$2,571	-$2,571	$0	$0
2. Tank Systems	-$2,991	+$56	-$2,991	-$2,991	$0	$0
3. Containment Bldgs	-$4,839	+$56	-$4,839	-$4,839	$0	$0
C. Total Burden Hour Reduction to **Both Parties** (A+B):						
1. Containers	-$3,606	+515	-$3,606	-$3,606	-$109	-$409
2. Tank Systems	-$4,026	+515	-$4,026	-$4,026	-$109	-$409
3. Containment Bldgs	-$5,874	+515	-$5,874	-$5,874	-$109	-$409
Explanatory Notes: (b) All monetary values in this table rounded to nearest whole dollar (1999$). (c) "+" indicates an incremental increase and "-" indicated an incremental decrease in burden costs relative to the conventional RCRA permit process baseline.						

Table 11: Expected Average Annual Future Frequency of RCRA "Standardized" Permit Actions							
			New permits		Modifications*		Total annual permit actions
Type of Eligible RCRA TSF Unit	Re-newals	Conver-sions **	New TSFs	Interim status	Routine (1or2)	Significant (class 3)	
1. Containers	12	73	2	79	17	7	190
2. Tank Systems	8	51	1	67	13	5	145
3. Containment Bldgs	0	1	0	4	1	0	6
Non-duplicative totals	14	79	2	80	18	7	**200**

Explanatory Notes:
(a) Source: Based on data supplied in Table 2 of the ICF Inc. report "Supporting Statement for Information Collection Request Nr. 1935.01: Standardized Permit for RCRA Hazardous Waste Facilities", 16 Nov 1999. Data in that source are based on ICF Inc's analysis of the USEPA RCRA "Permitting Program Accomplishments Report" (PPAR) for the period 01 Oct 1980 to 04 Oct 1999, excluding Federally-owned TSFs; annual frequencies above based on USEPA professional judgement as reported in the ICF Inc. source report. The USEPA PPAR data are available via the Internet at http://www.epa.gov/oswfiles/rcraweb/web_reporting/permit.htm .
(b) * As applied in the ICF Inc. source report, "routine" modifications assumed as 10% of subtotal renewals + conversions + new permits, and "significant" modifications assumed as 4% of this same subtotal.
(c) ** Conversions limited to six years and total of 433 (i.e. 50% of existing eligible TSFs; consequently, the average annual number of permit actions **drops from 200 to 121** (i.e. 200-79) after six years.
(d) The "Sensitivity Analysis" Section IV of this Economics Background Document provides alternative (i.e. non-constant) future annual permit action assumptions. Because of the underlying cyclical nature of annual permit actions corresponding to 10-year permit validation periods, a uniform annual number of permit actions is a simplification.

Table 12: Estimate of Potential National Cost Savings for the "Standardized" RCRA Permit Proposal

Permit Cost Savings Recipient	Average Annual Savings ($000)	Percentage Share
1. Eligible RCRA TSFs	$98	24%
2. USEPA/State Permit Authorities	$306	76%
Combined National Savings (1+2)	$404	100%
With Estimation Uncertainty Assigned*:		
Lower-bound estimate (-10%)=	**$364**	
Upper-bound estimate (+30%) =	**$525**	

Explanatory Notes:
(a) Average annual permitting cost savings estimated over a future 30-year period 2001-2030, at constant 1999$ and using the OMB 7.00% discount rate.
(b) * Uncertainty= An overall cost savings estimation uncertainty bound of -10% to +30% applied per "Recommended Practice Nr.18R-97" (15 June 1998, Association for the Advancement of Cost Engineering http://www.aacei.org).

Table 10 indicates that on a per-permit basis, the "standardized" permit will affect a decrease in average RCRA permitting costs (i.e. a reduction in administrative burden), ranging in combined value to eligible TSFs and to permitting authorities, from about **$100 to $5,800 per permit action** (1999$), depending upon the type of permit action involved (i.e. a reduction ranging from **2 to 140 hours** per permit action).

Table 10 also confirms the economic incentive to eligible TSFs of converting (i.e. switching) to a standardized permit, as evidenced by the average $459 permit conversion cost being almost completely offset by the $409 savings to TSFs of a single "significant" modification (or of the savings from only four "routine" modifications: 4 x $109 = $436). At a very minimum in absence of future permit modification savings, the $1,035 savings to TSFs from future permit renewals after conversion, results in a minimum net savings of $576 per permit (i.e. $1,035 - $459).

In contrast to expected cost savings, permit conversion actions (i.e. switching conventional RCRA permits to "standardized" RCRA permits before expiration), are expected to result in a temporary increase in permitting costs of about $500 per conversion action (1999$), because conversion actions would not occur under the conventional RCRA permitting process baseline.

Table 12 presents the RCRA permitting cost savings estimate on a national basis. On an average

annual equivalent (AAE) basis, Table 12 indicates that the estimated range in national cost savings is **$0.36 to $0.53 million** per year (1999$). This range reflects ***estimation uncertainty*** applied to the point estimate of **$0.40 million** in average annual cost savings. As displayed in **Attachment B-2**, the average annualized equivalent (AAE) national cost savings of $0.40 million equates to:

- A discounted net present value (NPV) of **$5.0 million** in cost savings over the 30-year future period-of-analysis (POA); and
- **$11.5 million** in non-discounted total cost savings over the 30-year POA.

This cost savings analysis is based upon an assumed constant average annual RCRA permit action frequency (i.e. for permit renewals, new permits, and modifications), based on the identical annual RCRA permit action frequencies applied in the ICR reference "Source C". That reference developed an assumed annual permit action frequency based upon RCRA permitting action data from the "Permitting Program Accomplishments Report" for the 20-year period October 1980 to October 1999, in conjunction with USEPA best professional judgement.

Table 12 also indicates that **76%** of the average annual savings are expected to accrue to permit authorities, which is an initial indication that although voluntary, the standardized RCRA permit program is potentially advantageous to states which decide to implement it.

Table 13 compares the estimated cost savings for a standardized permit action, to the average burden cost associated with conventional RCRA permit actions. The average burden reduction ranges between **4% to 14%**, depending upon (a) the type of permit action, and (b) whether burden hours or burden cost are used as a comparative measure of burden.

Table 13: Estimated Reduction in RCRA Permit Burden, as a Percentage of Average Burden for a Conventional RCRA Permit Action

Type of Permit Action	% Hour Savings	% Cost Savings
A. New Permits & Permit Renewals:		
A1. Containers	10%	7%
A2. Tank systems	11%	8%
A3. Cont bldgs	14%	11%
B. Permit modifications:		
B1. Routine	10%	9%
B2. Significant	4%	4%

Explanatory Notes:
(a) Source: See supporting data and computations in **Attachments B5 & B6.**
(b) %hour and %cost savings are slightly different because of differences in labor category wage rates and the relative proportion of four labor categories in contributing to savings.

It is important to emphasize that this cost savings estimation range reflects and is contingent upon at least four sources of cost savings ***estimation uncertainty***:

- The ultimate future number of states which voluntarily adopt this type of permitting process.

- The future average annual number of eligible TSFs which apply for this type of permit.
- The future average annual level of permitting activities involving new permits, permit modifications, permit renewals, and permit conversions.
- Average number of burden hours and associated burden cost per RCRA permit activity.

III-D. Does This "Economics Background Document" Comply with Federal Regulatory Analysis Requirements?

Yes; this document provides the data, analysis and findings which support the Federal regulatory economic analysis requirements of the following:

- Executive Order 12866 "Regulatory Planning and Review", (30 Sept 1993). (see http://www.nara.gov/fedreg/eo.html#top).
- Unfunded Mandates Reform Act of 1995 (PL 104-4). (see http://www.access.gpo.gov/nara/publaw/104publ.html).
- Regulatory Flexibility Act of 1980 (PL 96-354), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (PL 104-121). (see http://www.nara.gov/fedreg/legal/).

The preamble to the Federal Register announcement for the standardized RCRA permit proposal, contains a description of these Federal regulatory economic analysis requirements, as well as provides an explanation of compliance with these requirements, which is not duplicated in this document to reduce reader burden.

IV. SENSITIVITY ANALYSES

This final section illustrates how the estimated magnitude of national cost savings for the standardized RCRA permit proposal, varies according to four parameters:

- Period-of-analysis (POA).
- Discount rate.
- Annual number of RCRA permit actions (i.e. future number of eligible TSFs).
- Inflation rate.

With respect to these three sensitivity analysis framework elements, the "***base case***" applied in this economic study consists of:

- POA = **30**-years (i.e. base year 2001 to 2030).
- Discount rate = **7.0%** (as prescribed by January 1996 OMB guidance).
- Permit actions = Constant average annual rate of **121** actions (after the 79 conversions per year phase-out in year six).
- Inflation rate = **0.0%** (consistent with economic analysis practices).

The sections below present the estimated national cost savings according to alternative numerical values assigned to these four parameters, to reflect uncertainty in future values. **Attachment C** at the end of this document provides supporting data and computation spreadsheets.

IV-A. Does National Cost Savings Depend Upon the Period-of-Analysis and the Discount Rate Applied?

Yes. OMB states in its 1992 discount rate guidance "Circular A-94" to Federal agencies, that economic benefit and cost analyses:

> "*[S]hould show the sensitivity of the discounted net present value [of program benefits and costs] and other outcomes to variations in the discount rate, [including] a higher discount rate than 7 percent*". (OMB Circular A-94 "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs", 29 Oct 1992, p.9, http://www.whitehouse.gov/OMB/circulars/a094/a094.html).

However, as indicated in the prior section of this study, OMB does not specify any required POA or sensitivity analysis range for POAs.

A discount rate range of 3% to 10% is applied in this document and displayed in Table 14 below. This 3% to 10% range is identical to the range defined by the USEPA as relevant to illustrating the sensitivity of net present value calculations for environmental economics studies, as stated in the Agency's "Guidelines for Regulatory Impact Analysis", March 1991 reprint, Appendix C, p.C4). At one level of generality, lower discount rates (e.g. <5%) are often classified as "*social*" or "*economic*" discount rates, whereas higher discount rates (e.g. >7%) are often classified as "*private*" or "*financial*" discount rates.[18]

[18] It is important to note that ***discounting*** which introduces "consumer time preference" or "investor opportunity cost of resources" into analyses, is distinctly different from the phenomenon and analytical treatment of ***price inflation***. It is also particularly important within the context of environmental economics, to indicate that ***discounting*** is a controversial topic amongst economists. For example, in contrast to its accepted and almost universally-prescribed application in Federal economic analyses and in other public and private sector financial investment decision-making contexts, some economists argue that the practice of discounting applied in an environmental decision-making context is inappropriate, in that discounting denies human intergenerational and ecological equity, and excludes natural resource preservation, among other reasons. For contemporary surveys of reasons for and against the practice of discounting, see: (a)

For POA sensitivity analysis, two shorter POAs are applied: 10-year and 20-year POAs. Both alternative POAs may be said to represent "short-term" POAs, compared to the base case 30-year POA which represents a "medium-term" POA. Because of the inherent uncertainty in projecting RCRA permitting activities beyond the medium-term, a "long-term" POA is not presented (the USEPA's March 1991 reprint "Guidelines for Preparing Regulatory Impact Analysis" indicates a 50-year POA as "long-term" ("Supplemental Appendix C", pp.7,8)).

Table 14: Sensitivity Analysis of Estimated National Cost Savings (to Both Eligible TSFs and to Permitting Authorities Combined), According to Alternative Discount Rates and Period-of-Analyses ($millions)

Discount Rates>	0%	3%	5%	7%	10%
A. Average Annual Equivalent (AAE):					
10-year POA	$0.37	$0.38	$0.39	$0.39	$0.40
20-year POA	$0.38	$0.39	$0.40	$0.40	$0.41
30-year POA	$0.38	$0.39	$0.40	$0.40	$0.41
B. Net Present Value (NPV):					
10-year POA	$3.7	$3.2	$3.0	$2.8	$2.5
20-year POA	$7.6	$5.8	$4.9	$4.3	$3.5
30-year POA	$11.5	$7.7	$6.1	$5.0	$3.9

Explanatory Notes:
(a) Shaded cells in this table indicate the "base case" of this study, based on OMB's 7.00% discount guideline and a "medium-term" 30-year POA.
(b) The zero percent (0%) discount rate represents non-discounted total cost savings over the respective POAs.

IV-B. Does National Cost Savings Depend Upon the Level of Future RCRA Permitting Actions?

Although a constant average annual future stream of RCRA permit actions is applied in this document as the analytical ***base case***, it is conceivable that the future annual RCRA permit action frequency may deviate from this historical permit action trend, because of numerous economic factors including but not limited to the following:

Eligible TSFs: Future change (i.e. net increase or net decrease) in the US national number of operating TSFs eligible for "standardized" RCRA permits. Among other factors, this is determined by the number of new TSF construction starts and the number of future TSF closures.

Portney, Paul R. & John P. Weyant, eds, Discounting and Intergenerational Equity, Resources for the Future (RFF) Press, 1999, 186pp., and (b) Price, Colin, Time, Discounting & Value, Blackwell Publishers Oxford UK, 1993, 411pp.

Permit Actions: Future change in the number and type of RCRA permit actions involving eligible TSFs.

RCRA rules: Future additions/subtractions to the universe of RCRA wastecodes and other standards, which ultimately determine the number and annual quantity of wastestreams which may be managed by eligible hazardous waste TSFs.

Consequently, the estimate of national cost savings developed in this study is sensitive to the direction of change in these and other factors affecting annual count of RCRA permit actions. **Attachments C-1 to C-5** provide supporting data and computations to illustrate this sensitivity.

To illustrate this point, the number of US national RCRA permitted TSDFs as reported in the USEPA "Biennial Reporting System" (BRS) national survey database for the 13-year period 1985-1997 (as displayed in Table 3 of this background document), are presented in the form of timeseries data graphs in **Attachment C-1** at the end of this document. This attachment presents two alternative graphs, each containing two lines: one line which connects the raw BRS datapoints, and a second line which depicts the linear-regression trend based on the datapoints (**Attachment C-2** presents the regression results):

All data: The top graph on **Attachment C-1** plots all seven BRS datapoints (i.e. the national number of TSDFs for BRS datayears 1985, 1987, 1989, 1991, 1993, 1995, 1997). Visual inspection of this first graph indicates that four of the BRS datapoints appear to fall along the same downward sloping trendline, while three BRS datapoints appear as "***outliers***" located above or below this trendline. The overall "fit" of the linear-regression trendline to these seven datapoints is only 76%.[19]

Non-outlying data: The bottom graph on **Attachment C-1** plots five non-outlying datapoints from the seven (i.e. the national number of TSDFs for BRS datayears 1987, 1989, 1993, 1995, 1997). The two "outlying" datapoints (i.e. BRS datayears 1985 and 1991) represent deviations greater than **+/-10%** from the linear regression expected trend value for those years based on the overall linear regression trendline established by the other four "non-outlying" datapoints. Removal of the two outlier datapoints improves the overall "fit" of the regression trendline to 95%.[20]

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[19] One way to decide quantitatively how well a straight trendline fits a set of datapoints, is to note the extent to which the individual datapoints deviate above or below the trendline. This deviation is measured as the difference in numerical values between the datapoint and the corresponding value along the trendline. Deviations from trend are expressed by the regression "***R-squared***" value, which may range from 0% (i.e. "no fit") to 100% (i.e "perfect fit"), as the representation in a single number, of the "goodness of fit" of a regression trendline relative to its datapoints.

[20] Extreme datapoints (observations) that are detached from the remainder of the data are called "***outliers***", and they usually receive special attention in statistical analyses. Although outliers may represent legitimate measurements, they are more often "mistakes", i.e. incorrectly recorded observations, miscoded input into a computer, or measurements from a different population than the population from which the rest of the sample data was selected. In other cases when outlying data are correct, further analysis of outliers may reveal special cases, factors or other considerations. Because the BRS survey, particularly in its earlier years is subject to national sampling variability and to other sources of survey errors (e.g. because of data flaws, the USEPA did not release the 1981 and 1983 BRS databases), the exclusion of outlying data is reasonable for the purpose of establishing overall time trends in the BRS database. On the other hand, there are also "***curvilinear***" regression trendlines which may better "fit" all of the seven BRS datapoints, by accounting for trend curvature over time. Because most data relationships (i.e. correlations or associations) with another data variable (such as years) possess some curvature,

Both the datapoint lines and the simple linear regression trendlines in each graph show that the US national number of all RCRA-permitted TSDFs has declined significantly during this 13-year data period (1985 to 1997).

IV-B.1 Linear Scenario Projection

These historical BRS data provide one simple and convenient basis for establishing a ***scenario*** for the future number of eligible TSFs, which may serve as a proxy or indicator for the possible number of future RCRA permitting actions. Although the activity of ***forecasting*** is often controversial, from an inferential statistics theoretical perspective[21], one of the most prominent and least expensive of formal forecasting methods is afforded by trend projection involving linear extrapolation of prevailing (i.e. historical and current) trends. (However, forecasting theorists warn that the crucial premisses of this trend projection reasoning – the continuation of present trends – is usually very unlikely to be realized.)

Trend projection involves extrapolation of the timeseries trendline inherent in the past and current datapoints. As displayed in **Attachment C-2** to this document, using linear (i.e. straight-line) trend projection as alternatively applied to both the full BRS dataset (i.e. seven datapoints) and to the non-outlying dataset (i.e. five BRS datapoints), the forecasted future number of RCRA TSDFs is projected (unreasonably) to decrease to zero by the year 2007 and 2011, respectively.

This unreasonable linear trend projection result suggests that a "***curvilinear***" (i.e. second- or third-order) rather than a "***linear***" (i.e. first-order) regression – upon which to base a trend projection forecast – may better "fit" a more reasonable trendline to the historical data, as well as provide a more reasonable ***scenario projection*** of the future national number of TSDF.

IV-B.2 Curvilinear Scenario Projection

The subfield of statistical science associated with trend projection is called "***model building***", which is defined as developing a statistical model that will:

- Provide a good fit to a set of data
- Give good projections or predictions of future values of the data.

Statistical models may take many different mathematical functional forms, but at the risk of oversimplification, the most common models are usually the following linear (single variable) and two curvilinear (polynomial variable) forms:

First-order (linear) $m = " + \$1*P$ or $\text{Log}(m) = " + \$1*P$

Second-order (curvilinear) $m = " + \$1*P + \$2*P^2$

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curvilinear trend models will often better "fit" a dataset. For additional information on data outliers and data regression, see J.T. McClave & P.G. Benson, Statistics for Business and Economics, Dellen-Macmillan, 1988.

[21] It is important to distinguish between two fundamentally different conceptual orientations to ***forecasting***:

- ***Prediction***: Indicating what the future will (probably or presumably) be by informative specifications attempting to preindicate what will happen (i.e. concern with actualities).
- ***Scenario projection***: Indicating what the future might be by surveying possible courses of future developments by formulating imaginative speculations about what might happen (i.e. concern with possibilities).

The latter rather than the former is the conceptual orientation applied in the historical data trendline projections of this study for purpose of sensitivity analysis.
One recent academic reference to the theory of forecasting is Nicholas Rescher, Predicting the Future: An Introduction to the Theory of Forecasting, State University of New York Press, 1998, 315pp.

Third-order (curvilinear) $m = \alpha + \beta_1 P + \beta_2 P^2 + \beta_3 P^3$

Where:
m = dependent data variable (annual count of TSDFs)
α = constant term (estimated by statistical regression)
β = coefficient (estimated by statistical regression)
P = independent data variable (data year in time series)
Log = either natural or base-10 logarithm.

In general, a graph of a nth-order polynomial (curvilinear) model will contain a total of (n-1) peaks and troughs (i.e inflexion points), such that time series data which exhibit a single change in curve slope may be fit with a second-order curvilinear model, whereas data which exhibit two or more changes in curve slopes may be better fit with a third-order (or higher) curvilinear model.

Attachments C-3 and C-4 present the resultant curvilinear trend projection graphs and data associated with second- and third-order curvilinear modeling based on the 13-year TSDF universe historical data (i.e. 1985-1997), along with a scenario projection for the future 30-year period-of-analysis (i.e. 2001-2030 POA). As shown by both the resultant data-fit curves in **Attachment C-3** and the *R-squared* values in **Attachment C-4**, the third-order curvilinear model both:

Historical data fit	Better "fits" the data (as evidenced by an R-squared value of 86% for the third-order model, compared to 80% for the second-order model).
Future projection	Provides a reasonable scenario projection out to the year 2030 (the third-order model reasonably projects a slightly-declining TSDF universe at an average annual rate of 2.9%, whereas the second-order model unreasonably projects a zero TSDF universe by the year 2013).

It is important to emphasize that in contrast to this regression-projected decrease in the future TSDF universe, it is possible that this declining ***scenario projection*** is not an accurate ***prediction,*** because the number of TSDFs in the USA may grow overtime as a result of future economic factors such as:

Demand-side	• Annual hazardous waste generation quantities may increase overtime as industries and markets grow domestically and globally, thereby increasing the market demand for TSDFs. • Expansion over time of the number of industrial wastestreams brought into the RCRA "hazardous" waste regulated universe, which may place an increased demand for TSDF services, and a consequent growth in the size and/or number of TSDFs.
Supply-side	The universe of TSDFs may grown as a result of regulatory streamlining such as the "standardized" RCRA permit proposal or other "deregulatory" actions within the RCRA program, which makes the cost of permitting and operating an affected TSDF relatively less expensive, thereby increasing the supply of such facilities.

Consequently, it is important to consider this sensitivity analysis exercise as a *projection* rather than *prediction*.

As shown in **Attachment C-5**, applying the projected **2.9% average annual decline** in the TSDF universe to the ***base case*** – consisting of the 30-year (2001-2031) POA and 7.00% discount rate -- the estimate of national cost savings decreases slightly, as summarized in Table 15. For purpose of scenario bounding, applying a symmetric **2.9% average annual increase** as a second alternative scenario projection relative to the *base case*, increases national cost savings slightly, as also displayed in Table 15.

Table 15: Sensitivity Analysis: Effect of Alternative Future Annual Levels of Eligible Permitting Actions ($millions over the 30-year POA 2001-2031)			
		Alternative Scenarios**	
Cost Savings Metric	Base Case*	-2.9%	+2.9%
Non-discounted total savings	$11.5	$11.2	$11.9
Net present value savings	$5.0	$4.9	$5.2
Average annual equivalent savings	$0.40	$0.39	$0.42

Explanatory Notes:
(a) * Base Case = Beginning with 200 average annual eligible RCRA permit actions in baseyear 2001, leveling off (after 79 average annual conversion actions phase-out after the sixth year (2006)), to 121 average annual actions through the end of the 30-year POA (2030).
(b) ** Alternative scenarios reflect -/+ bounding projections in the future annual count of eligible RCRA permitting actions, relative to the constant annual count "base case".

IV-C. How Does Inflation Affect Estimated Cost Savings?

Table 16 below displays the results of relaxing the "***constant dollar***" economic analysis valuation framework, by applying ***inflation*** to the labor wage rates which underlie the cost savings estimates. In general, inflation is defined as an increase in either a **specific** (i.e. single price) or **general** (i.e. weighted average) price level of goods and services available in a particular market, or on a broader multi-market, regional or national basis. Another way to describe inflation is in terms of decreasing ***purchasing power*** of a unit of currency (e.g. one dollar).

Inflation is usually measured by a price level index that assigns a value of 100 to a reference base-year. The most widely used general inflation index in the USA is the "Consumer Price Index" (CPI), which is based on the weighted average of prices in a sample of food, clothing, shelter, transportation, and other items purchased by the average urban consumer (see the following website for the Department of Labor Bureau of Statistics "CPI" and other types of price indexes: http://stats.bls.gov/datahome.htm).

Apart from this sensitivity analysis, this study did not apply inflation in the "***base case***", because economic analyses usually apply a constant dollar valuation framework with time-discounting, for the purpose of standardizing monetized values (e.g. monetized benefits and monetized costs) to a single "base year" reference. The analytical method of discounting provides time value "***economic equivalence***" of cash flows which occur at different points in time.

However, for purpose in this study of supplying an estimate of the potential financial cost savings in relation to the nominal dollar value of cost savings in future budget years, the inflation rate is included as a fourth sensitivity analysis element.

Table 16: Sensitivity Analysis: Effect of Inflation on Estimated National Cost Savings ($millions for the 30-Year POA 2001 to 2031)		
Cost Savings Metric	Base Case*	Inflation**
1. Non-discounted total POA savings	$11.5	$16.3
2. Non-discounted average annual savings	$0.38	$0.54

Explanatory Notes:
(a) Attachment C-12 at the end of this document provides detailed inflation computations.
(b) * Base Case = 0% inflation rate or "constant" dollars (shaded cells above).
(c) ** Inflation = projection and application of white-collar employment cost index to estimated future cost savings.
(d) Values in this table have not been discounted as in previous tables in this report.

There are two general causal mechanisms for inflation:

"***Cost-push" inflation***:	Occurs when prices are largely determined by the cost of producing them (e.g. raw materials, labor, energy, overhead).
"Demand-pull" inflation:	Occurs when the recipients of increasing disposable income attempt to spend the additional income on a fixed flow (i.e. static or constrained supply) of goods and services.

Because labor costs underlie the monetary value of permitting cost savings in this study, a cost-push type inflation is modeled and applied.

This effect of applying inflation to future cost savings, is based on applying the US Department of Labor, Bureau of Labor Statistics "Employee Cost Index" (ECI), to the future stream of estimated cost savings, for both RCRA permitting authorities and for eligible TSFs. As displayed in the series of **Attachments C-6 to C-12** at the end of this document, 1983-1999 historical ECI data for "white-collar total compensation" for both:

- state and local governments, and
- private industry,

were used as a basis of producing regression-fit trendline projections over the 30-year POA. The resultant regression trendline projections selected as the basis of a cost-push inflation factor are indicated by column shading in the Attachments, as well as in the accompanying graphs in the Attachments. The overall average annual percentage inflation rate assigned to the respective inflation rates are **2.10%** and **2.06%**, based on regression-projected inflation indexes ranging from **1.000 to 1.826** and from **1.000 to 1.808**, respectively, over the years 2001 to 2030 in the POA (refer to **Attachment C-12**).

ATTACHMENTS

A: PERMIT BURDEN HOUR COMPUTATION SPREADSHEETS

B: NATIONAL COST SAVINGS COMPUTATION SPREADSHEETS

C: SENSITIVITY ANALYSES SPREADSHEETS

ATTACHMENT A

UNIT HOUR
ADMINISTRATIVE BURDEN REDUCTION

DATA REFERENCE
AND
COMPUTATION SPREADSHEETS

ATTACHMENT A-1

USEPA RCRA "STANDARDIZED" PERMIT PROPOSAL FOR HAZARDOUS WASTE UNITS
COMPUTATION SPREADSHEET FOR UNIT HOUR BURDEN REDUCTION ASSUMPTIONS
STARTING COMPUTATIONAL ELEMENTS

Burden savings item	CFR	Type of permit	Data source*	Eligible TSFs (Burden Hours): Legal	Mngrl	Tech	Clerical	Row subtotals		Permit Authorities (Burden Hours): Data source*	Legal	Mngrl	Tech	Clerical	Row subtotals	
1	124.32	Conventnl>	B-Ex3	0.00	0.25	1.00	0.25	1.50		NR	NR	NR	NR	NR	NR	
		Standrdized>	NA	0.00	0.00	0.00	0.00	0.00		NR	NR	NR	NR	NR	NR	
		CP less SP=		0.00	0.25	1.00	0.25	1.50		NR	NR	NR	NR	NR	NR	
2	124.3	Conventnl>	NR	NR	NR	NR	NR	NR		A-Ex2	0.00	0.00	3.00	0.25	3.25	
		Standrdized>	NR	NR	NR	NR	NR	NR		NA	0.00	0.00	0.00	0.00	0.00	
		CP less SP	NR	NR	NR	NR	NR	NR			0.00	0.00	3.00	0.25	3.25	
3	124.3	Conventnl>	NR	NR	NR	NR	NR	NR		A Ex2	0.00	0.00	0.50	0.10	0.60	
		Standrdized>	NR	NR	NR	NR	NR	NR		NA	0.00	0.00	0.00	0.00	0.00	
		CP less SP=	NR	NR	NR	NR	NR	NR			0.00	0.00	0.50	0.10	0.60	
4	124.3	Conventnl>	A-Ex1	0.00	0.50	2.00	1.00	3.50		NR	NR	NR	NR	NR	NR	
		Standrdized>	NA	0.00	0.00	0.00	0.00	0.00		NR	NR	NR	NR	NR	NR	
		CP less SP=		0.00	0.50	2.00	1.00	3.50		NR	NR	NR	NR	NR	NR	
5	124.3	Conventnl>	NR	NR	NR	NR	NR	NR		A Ex2	0	0	0.75	0	0.75	
		Standrdized>	NR	NR	NR	NR	NR	NR		NA	0.00	0.00	0.00	0.00	0.00	
		CP less SP=	NR	NR	NR	NR	NR	NR			0.00	0.00	0.75	0.00	0.75	
6	270.10	Conventnl>	B-Ex2	1.00	0.00	1.00	0.00	2.00		NR	NR	NR	NR	NR	NR	
		Standrdized>	C-Ex1	0.00	0.50	0.50	0.00	1.00		NR	NR	NR	NR	NR	NR	
		CP less SP=		1.00	0.50	0.50	0.00	1.00		NR	NR	NR	NR	NR	NR	
	Item 6 unit hours represent difference for "read the regulations" estimated in reference documents under Exhibit item "Permit Application 270.10".															
7	270.10	Conventnl>	B Ex2	0.00	0.00	0.00	7.50	7.50		CP>	B Ex6	0.00	1.75	52.75	4.20	58.70	<If containers
		Standrdized>	NA	0.00	0.00	0.00	0.00	0.00		CP>	B Ex6	0.00	1.75	62.75	4.20	68.70	<If tanks
		CP less SP		0.00	0.00	0.00	7.50	7.50		CP>	B Ex6	0.00	1.75	106.75	4.20	112.70	<If cont.bldgs
										SP>	NA	0.00	0.00	0.00	0.00	0.00	
										CP less SP=		0.00	1.75	52.75	4.20	58.70	<If containers
										CP less SP=		0.00	1.75	62.75	4.20	68.70	<If tanks
										CP less SP		0.00	1.75	106.75	4.20	112.70	<If cont.bldgs
	Note: OSW EMRAD estimated clerical hours in red cell by multiplying 0.5 unit hours per submittal times 15 Part B submittal items listed in B Ex2. Item 7 (Part B submittal) is large source of savings to permit authorities because they no longer will review Part B which remains at the TSF.															
8	270.42	Conventnl>	B-Ex3	3.00	2.25	12.00	2.35	19.60	<Cls1	B-Ex7	0.00	0.75	3.00	0.10	3.85	
		Standrdized>	C-Ex2	3.00	2.25	10.00	2.25	17.50	<Cls1	C-Ex11	0.00	0.75	3.00	0.10	3.85	
		CP less SP=		0.00	0.00	2.00	0.10	2.10	<Cls1		0.00	0.00	0.00	0.00	0.00	<If class 1 or 2
		Conventnl>	B-Ex3	7.00	17.00	83.00	13.60	125.60	<Cls3	B-Ex7	20.00	1.25	41.00	0.10	62.35	
		Standrdized>	C Ex2	7.00	16.25	82.00	12.25	117.50	<Cls3	C Ex11	20.00	1.25	41.00	0.10	62.35	Discrepancy
		CP less SP		0.00	0.75	6.00	1.35	8.10	<Cls3		0.00	0.00	0.00	0.00	0.00	<If class 3
9**	270.51	Conventnl>	Item 6	1.00	0.00	1.00	0.00	2.00		NR	NR	NR	NR	NR	NR	
		Standrdized>	Item 6	0.00	0.50	0.50	0.00	1.00		NR	NR	NR	NR	NR	NR	
		CP less SP=		1.00	0.50	0.50	0.00	1.00		NR	NR	NR	NR	NR	NR	
	** Renewal (item 9) remains identical to a new permit application, so any change assumed identical to change in item 6.															
13a	264.112	Conventnl>	C-Ex7***	0.00	2.25	31.25	4.00	40.50		No data	0.00	0.00	23.00	0.00	23.00	
		Standrdized>	C-Ex7	0.00	2.25	31.25	4.00	40.50		C-Ex16	0.00	0.00	23.00	0.00	23.00	
		CP less SP		0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	
	*** Note: SP data used for IP in this case because closure plan required under both, but plan may be deferred under SP.															
13b	264.142	Conventnl>	B-Ex2	0.00	1.00	8.00	1.00	10.00		B-Ex5	4.00	1.00	16.00	0.00	21.00	
		Standrdized>	C-Ex7	0.00	0.25	0.25	0.00	0.50		C-Ex17	4.00	1.00	16.00	0.00	21.00	
		CP less SP=		0.00	0.75	7.75	1.00	9.50			0.00	0.00	0.00	0.00	0.00	

Explanatory Notes:

(a) CP= Conventional (i.e. "existing" or "baseline") RCRA TSF permit process. NR= Not relevant to party.
SP= Standardized RCRA TSF permit (i.e. proposed streamlined alternative RCRA permit process).
(b) * Source= First letter designates identity of reference document, "Ex" designates the unit hour data exhibit number in the reference document.
Source A: USEPA Office of Solid Waste ICR Nr. 262.09 (RCRA Part A Permit Application Requirements), 22 Oct 1999.
Source B: USEPA Office of Solid Waste ICR Nr. 1573 (RCRA Part B Permit Application Requirements), 27 Oct 1999.
Source C: USEPA Office of Solid Waste ICR Nr. 1986.01 (RCRA "Standardized" Permit Application Requirements), 16 Nov 1999.
(c) Burden savings items correspond to the same numbered savings items as listed in a table contained in the "Economics Background Document".
(d) Burden hour items above may represent subtotals based on more than one burden hour item from the ICR reference document exhibits.
(e) To reconcile SP data discrepancy, blue cell in item 8 assumed identical to CP burden hours.
(f) NA= This permit activity not applicable (i.e. not required) under standardized permit, so zero unit hours assigned for SP.

ATTACHMENT A-2

COMPUTATION OF COST SAVINGS PER PERMIT ACTION

for Administrative Burden Under the "Standardized" RCRA Permit Proposal

INTERMEDIATE COMPUTATIONAL ELEMENTS

I. Burden Hour Changes per Permit Action to:

		Eligible TSFs:					Permit Authorities:					
Savings Items	Item	Legal	Mngrl	Tech	Clerical	Subtotals	Legal	Mngrl	Tech	Clerical	Subtotals	Totals
	1	0.00	0.25	1.00	0.25	1.50	NR	NR	NR	NR	NR	1.50
	2	NR	NR	NR	NR	NR	0.00	0.00	3.00	0.25	3.25	3.25
	3	NR	NR	NR	NR	NR	0.00	0.00	0.50	0.10	0.60	0.60
	4	0.00	0.50	2.00	1.00	3.50	NR	NR	NR	NR	NR	3.50
	5	NR	NR	NR	NR	NR	0.00	0.00	0.75	0.00	0.75	0.75
	6	1.00	-0.50	0.50	0.00	1.00	NR	NR	NR	NR	NR	1.00
Containers>	7a	0.00	0.00	0.00	7.50	7.50	0.00	1.75	52.75	4.20	58.70	66.20
Tanks>	7b	0.00	0.00	0.00	7.50	7.50	0.00	1.75	62.75	4.20	68.70	76.20
Cont.bldgs>	7c	0.00	0.00	0.00	7.50	7.50	0.00	1.75	106.75	4.20	112.70	120.20
Routine mods>*	8a	0.00	0.00	2.00	0.10	2.10	0.00	0.00	0.00	0.00	0.00	2.10
Signifnt mods>	8b	0.00	0.75	6.00	1.35	8.10	0.00	0.00	0.00	0.00	0.00	8.10
Renewals**>	9	Identical to burden change for new permit applications.					Identical to burden change for new permit applications.					
	13a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13b	0.00	0.75	7.75	1.00	9.50	0.00	0.00	0.00	0.00	0.00	9.50
Subtotals for Items Relevant to New Permit Actions & to Renewals:											Items included in subtotals	
Containers>	7a	1.00	1.00	11.25	9.75	23.00	0.00	1.75	57.00	4.55	63.30 <<(1 -...-6+7a+13a+13b)	86.30
Tanks>	7b	1.00	1.00	11.25	9.75	23.00	0.00	1.75	67.00	4.55	73.30 <<(1 ... 6+7b+13a+13b)	96.30
Cont.bldgs>	7c	1.00	1.00	11.25	9.75	23.00	0.00	1.75	111.00	4.55	117.30 <<(1 ... 6+7c+13a 13b)	140.30
Switching***>		0.50	1.25	2.25	0.50	4.50	0.00	0.25	1.00	0.00	1.25	5.75

II. Value of Burden Hour Changes per Permit Action:

Loaded wage*>		$102	$73	$53	$27		$61	$57	$42	$17		
	1	$0	$18	$53	$7	$78	NR	NR	NR	NR	NR	$78
	2	NR	NR	NR	NR	NR	$0	$0	$126	$4	$130	$130
	3	NR	NR	NR	NR	NR	$0	$0	$21	$2	$23	$23
	4	$0	$37	$106	$27	$170	NR	NR	NR	NR	NR	$170
	5	NR	NR	NR	NR	NR	$0	$0	$32	$0	$32	$32
	6	$102	($37)	$27	$0	$92	NR	NR	NR	NR	NR	$92
Containers>	7a	$0	$0	$0	$203	$203	$0	$100	$2,216	$71	$2,387	$2,589
Tanks>	7b	$0	$0	$0	$203	$203	$0	$100	$2,636	$71	$2,807	$3,009
Cont.bldgs>	7c	$0	$0	$0	$203	$203	$0	$100	$4,484	$71	$4,655	$4,857
Routine mods>*	8a	$0	$0	$106	$3	$109	$0	$0	$0	$0	$0	$109
Signifnt mods>	8b	$0	$55	$318	$36	$409	$0	$0	$0	$0	$0	$409
Renewals**>	9	Identical to burden change for new permit applications.					Identical to burden change for new permit applications.					
	13a	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	13b	$0	$55	$411	$27	$493	$0	$0	$0	$0	$0	$493
Subtotals for Items Relevant to New Permit Actions & to Renewals:											Items included in subtotals	
Containers>	7a	$102	$73	$596	$263	$1,035	$0	$100	$2,394	$77	$2,571 <<(1 -...-6+7a+13a+13b)	$3,606
Tanks>	7b	$102	$73	$596	$263	$1,035	$0	$100	$2,814	$77	$2,991 <<(1 -...-6+7b+13a+13b)	$4,026
Cont.bldgs>	7c	$102	$73	$596	$263	$1,035	$0	$100	$4,662	$77	$4,839 <<(1 ... 6+7c+13a 13b)	$5,874
Switching***>		$51	$120	$230	$51	$459	$0	$14	$42	$0	$56	$515

Explanatory Notes:

(a) For definition of savings items numbers, see explanatory footnotes in the tables within the text of the "Economics Background Document".
(b) Negative dollar values (in parentheses) indicate additional incremental cost under the standardized permit, not a cost savings.
(c) Green shaded cells above indicate subtotals to be carried over as intermediate computational elements in estimation of national cost savings.
(d) * 1999 overhead "loaded wage" rates in red shaded cells above adopted from the 16 Nov 1999 USEPA ICR Nr.1935.01 (i.e. ICR "Source C").
(e) ** Renewal of "interim status" permits upon expiration assigned burden savings identical to new permit applications (items 7a, 7b, 7c).
(f) *** "Switching" involves converting a conventional permit to a standardized permit prior to its 10-year expiration date (ICR "Source C" Exh1 & Exh1 I):
Note: In contrast to burden hour reduction, "switching" (or conversion) involves added burden hours because switching would not occur in the baseline.
The benefit to some TSFs of switching before conventional permit expiration, is that subsequent modification actions will be less burdensome.
(g) NR = Not relevant to affected entity under proposal.

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ATTACHMENT B

COMPUTATION OF NATIONAL COST SAVINGS

– SAVINGS COMBINED (TSDFs + AUTHORITIES)

– SAVINGS TO ELIGIBLE RCRA TSDFs

– SAVINGS TO RCRA PERMIT AUTHORITIES

ATTACHMENT B-1

STANDARDIZED RCRA PERMITS:

Assumed Annual Number of Future "Standardized" Permit Actions

	Item	POA* Year	Renewals** Contrs	Tanks	Cnt.Bldg	Conver-sions***	Interim Status** Contrs	Tanks	Cnt.Bldg	New Facilities** Contrs	Tanks	Cnt.Bldg	Modifications** Routine	Signfct	Row totals
Base>	1	2001	6	8	0	79	9	67	4	1	1	0	18	7	200
	2	2002	6	8	0	79	9	67	4	1	1	0	18	7	200
	3	2003	6	8	0	79	9	67	4	1	1	0	18	7	200
	4	2004	6	8	0	79	9	67	4	1	1	0	18	7	200
	5	2005	6	8	0	79	9	67	4	1	1	0	18	7	200
	6	2006	6	8	0	38	9	67	4	1	1	0	18	7	159
	7	2007	6	8	0	0	9	67	4	1	1	0	18	7	121
	8	2008	6	8	0	0	9	67	4	1	1	0	18	7	121
	9	2009	6	8	0	0	9	67	4	1	1	0	18	7	121
	10	2010	6	8	0	0	9	67	4	1	1	0	18	7	121
	11	2011	6	8	0	0	9	67	4	1	1	0	18	7	121
	12	2012	6	8	0	0	9	67	4	1	1	0	18	7	121
	13	2013	6	8	0	0	9	67	4	1	1	0	18	7	121
	14	2014	6	8	0	0	9	67	4	1	1	0	18	7	121
	15	2015	6	8	0	0	9	67	4	1	1	0	18	7	121
	16	2016	6	8	0	0	9	67	4	1	1	0	18	7	121
	17	2017	6	8	0	0	9	67	4	1	1	0	18	7	121
	18	2018	6	8	0	0	9	67	4	1	1	0	18	7	121
	19	2019	6	8	0	0	9	67	4	1	1	0	18	7	121
	20	2020	6	8	0	0	9	67	4	1	1	0	18	7	121
	21	2021	6	8	0	0	9	67	4	1	1	0	18	7	121
	22	2022	6	8	0	0	9	67	4	1	1	0	18	7	121
	23	2023	6	8	0	0	9	67	4	1	1	0	18	7	121
	24	2024	6	8	0	0	9	67	4	1	1	0	18	7	121
	25	2025	6	8	0	0	9	67	4	1	1	0	18	7	121
	26	2026	6	8	0	0	9	67	4	1	1	0	18	7	121
	27	2027	6	8	0	0	9	67	4	1	1	0	18	7	121
	28	2028	6	8	0	0	9	67	4	1	1	0	18	7	121
	29	2029	6	8	0	0	9	67	4	1	1	0	18	7	121
	30	2030	6	8	0	0	9	67	4	1	1	0	18	7	121
Column totals=			180	240	0	433	270	2010	120	30	30	0	540	210	4063
					Limit>	433									

Explanatory Notes:

(a) Source: Count of average annual permit action for standardized permits from Table 2 of ICR reference "Source C".

(b) * POA = Period-of-analysis (30 years), relative to base year (2001) which represents first possible year of implementation.

(c) ** Translation of unit-based data from ICR "Source C" (Table 2), to facility-based annual permit action count data in table above, based on using tank and c.bldg units as facility permit counts, then assigning residual facility count as container facility permits:

	ICR "Source C" unit count distribution: Contnrs	Tanks	C.bldgs	Facilities	Translated facility permit count basis> Contnrs	Tanks	C.bldgs	Facilities
Renewals:	12	8	0	14	6	8	0	14
Interim status:	79	67	4	80	9	67	4	80
New permits:	2	1	0	2	1	1	0	2

Modifications annual count from Section 6(d) "Maintaining a Standardized Permit" of ICR reference "Source C".

(d) *** Conversion involves switching an existing individual permit before expiration to a standardized permit.
Conversions limited to six years and 433, because total number is limited to 50% of existing permitted eligible TSFs:
Existing fully-permitted eligible TSFs: 584 x 50% = 292.
Existing interim-status eligible TSFs: 281 x 50% = 140.
Total number of possible future conversions = 292 + 141 = 433.

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ATTACHMENT B-2

ELIGIBLE TSFs + PERMIT AUTHORITIES (COMBINED)

Future Annual "Standardized" Permit Estimated Cost Savings

$ Change Per Action>			($3,606)	($4,026)	($5,874)	$515	($3,606)	($4,026)	($5,874)	($3,606)	($4,026)	($5,874)	($109)	($409)	
		POA		Renewals				Interim Status			New Facilities		Modifications		
	Item	Year	Contrs	Tanks	Cnt.Bldg	Conversions	Contrs	Tanks	Cnt.Bldg	Contrs	Tanks	Cnt.Bldg	Routine	Signfct	Row totals
Base>	1	2001	($21,634)	($32,205)	$-0	$40,705	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($351,246)
	2	2002	($21,634)	($32,205)	$ 0	$40,705	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($351,246)
	3	2003	($21,634)	($32,205)	$ 0	$40,705	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($351,246)
	4	2004	($21,634)	($32,205)	$ 0	$40,705	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($351,246)
	5	2005	($21,634)	($32,205)	$ 0	$40,705	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($351,246)
	6	2006	($21,634)	($32,205)	$ 0	$19,580	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($372,371)
	7	2007	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	8	2008	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	9	2009	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	10	2010	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	11	2011	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	12	2012	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	13	2013	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	14	2014	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	15	2015	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	16	2016	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	17	2017	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	18	2018	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	19	2019	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	20	2020	($21,634)	($32,205)	$ 0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($391,951)
	21	2021	($21,634)	($32,205)	$ 0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($391,951)
	22	2022	($21,634)	($32,205)	$ 0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($391,951)
	23	2023	($21,634)	($32,205)	$ 0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($391,951)
	24	2024	($21,634)	($32,205)	$ 0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$ 0	($1,957)	($2,864)	($391,951)
	25	2025	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	26	2026	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	27	2027	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	28	2028	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	29	2029	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
	30	2030	($21,634)	($32,205)	$-0	$0	($32,450)	($269,715)	($23,494)	($3,606)	($4,026)	$-0	($1,957)	($2,864)	($391,951)
Column Totals=			($649,008)	($966,144)	$0	$223,103	($973,512)	($8,091,456)	($704,832)	($108,168)	($120,768)	$0	($58,698)	($85,932)	($11,535,415)
NPV=			($287,244)	($427,605)	$0	$192,540	($430,866)	($3,581,191)	($311,951)	($47,874)	($53,451)	$0	($25,979)	($38,033)	($5,011,652)
AAE=			($23,148)	($34,459)	$0	$15,516	($34,722)	($288,595)	($25,139)	($3,858)	($4,307)	$0	($2,094)	($3,065)	($403,871)

Explanatory Notes: 100%

(a) Negative dollar values (in parentheses) denote incremental cost savings relative to conventional RCRA permit baseline; positive values denote additional cost relative to baseline.

(b) OMB "Circular A-94" discount rate applied for computation of net present value (NPV) and average annual equivalent (AAE) over the 30-year period of analysis – 7.00%

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ATTACHMENT B-3

ELIGIBLE TSFs:

Future Annual "Standardized" Permit Estimated Cost Savings

Change Per Action>			($1,035)	($1,035)	($1,035)	$459	($1,035)	($1,035)	($1,035)	($1,035)	($1,035)	($1,035)	($109)	($409)	
				Renewals				Interim Status			New Facilities			Modifications	
	Item	Year	Contrs	Tanks	Cnt.Bldg	Conversions	Contrs	Tanks	Cnt.Bldg	Contrs	Tanks	Cnt.Bldg	Routine	Signfct	Row totals
Base>	1	2001	($8,207)	($8,276)	$-0	$36,261	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($67,872)
	2	2002	($8,207)	($8,276)	$-0	$36,261	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($67,872)
	3	2003	($8,207)	($8,276)	$-0	$36,261	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($67,872)
	4	2004	($8,207)	($8,276)	$-0	$36,261	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($67,872)
	5	2005	($8,207)	($8,276)	$-0	$36,261	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($67,872)
	6	2006	($8,207)	($8,276)	$-0	$17,442	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($86,691)
	7	2007	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	8	2008	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	9	2009	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	10	2010	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	11	2011	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	12	2012	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	13	2013	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	14	2014	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	15	2015	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	16	2016	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	17	2017	($8,207)	($8,276)	$ 0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$ 0	($1,957)	($2,864)	($104,133)
	18	2018	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	19	2019	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	20	2020	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	21	2021	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	22	2022	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	23	2023	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	24	2024	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	25	2025	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	26	2026	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	27	2027	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	28	2028	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	29	2029	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
	30	2030	($8,207)	($8,276)	$-0	$0	($9,311)	($69,312)	($4,138)	($1,035)	($1,035)	$-0	($1,957)	($2,864)	($104,133)
Column totals=			($188,210)	($248,280)	$0	$198,747	($279,315)	($2,079,345)	($124,140)	($31,035)	($31,035)	$0	($58,698)	($85,932)	($2,925,243)
NPV =			($82,415)	($109,886)	$0	$171,521	($123,622)	($920,296)	($54,943)	($13,736)	($13,736)	$0	($25,979)	($38,033)	($1,211,123)
AAE =			($8,641)	($8,855)	$0	$13,822	($9,962)	($74,163)	($4,428)	($1,107)	($1,107)	$0	($2,091)	($3,065)	($97,600)

Explanatory Notes: Percent of total AAE savings > 24%

(a) Negative dollar values (in parentheses) denote incremental cost savings relative to conventional RCRA permit baseline; positive values denote additional cost relative to baseline.

(b) OMB "Circular A 94" discount rate applied for computation of net present value (NPV) and average annual equivalent (AAE) over the 30 year period of analysis = 7.00%

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ATTACHMENT B-4

RCRA PERMIT AUTHORITIES:

Future Annual "Standardized" Permit Estimated Cost Savings

$ Change Per Action=>			($2,571)	($2,991)	($1,839)	$56	($2,571)	($2,991)	($1,839)	($2,571)	($2,991)	($1,839)	$-0	$-0	
				Renewals				Interim Status			New Facilities			Modifications	
	Item	Year	Contrs	Tanks	Cnt.Bldg	Conversions*	Contrs	Tanks	Cnt.Bldg	Contrs	Tanks	Cnt.Bldg	Routine	Signfct	Row totals
Base>	1	2001	($15,427)	($23,929)	$ 0	$4,444	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$ 0	$ 0	$ 0	($283,374)
	2	2002	($15,427)	($23,929)	$-0	$4,444	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($283,374)
	3	2003	($15,427)	($23,929)	$ 0	$4,444	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$ 0	$ 0	$ 0	($283,374)
	4	2004	($15,427)	($23,929)	$-0	$4,444	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($283,374)
	5	2005	($15,427)	($23,929)	$ 0	$4,444	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$ 0	$ 0	$ 0	($283,374)
	6	2006	($15,427)	($23,929)	$-0	$2,138	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($285,680)
	7	2007	($15,427)	($23,929)	$ 0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$ 0	$ 0	$ 0	($287,818)
	8	2008	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	9	2009	($15,427)	($23,929)	$ 0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$ 0	$ 0	$ 0	($287,818)
	10	2010	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	11	2011	($15,427)	($23,929)	$ 0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$ 0	$ 0	$ 0	($287,818)
	12	2012	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	13	2013	($15,427)	($23,929)	$ 0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$ 0	$ 0	$ 0	($287,818)
	14	2014	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	15	2015	($15,427)	($23,929)	$ 0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$ 0	$ 0	$ 0	($287,818)
	16	2016	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	17	2017	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	18	2018	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	19	2019	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	20	2020	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	21	2021	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	22	2022	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	23	2023	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	24	2024	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	25	2025	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	26	2026	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	27	2027	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	28	2028	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	29	2029	($15,427)	($23,929)	$-0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$-0	$-0	$-0	($287,818)
	30	2030	($15,427)	($23,929)	$ 0	$0	($23,140)	($200,404)	($19,356)	($2,571)	($2,991)	$ 0	$ 0	$ 0	($287,818)
Column totals=			($462,798)	($717,864)	$0	$24,356	($694,197)	($6,012,111)	($580,692)	($77,133)	($89,733)	$0	$0	$0	($8,610,172)
NPV =			($204,829)	($317,719)	$0	$21,020	($307,244)	($2,660,895)	($257,008)	($34,138)	($39,715)	$0	$0	$0	($3,800,529)
AAE =			($16,506)	($25,604)	$0	$1,694	($24,760)	($214,432)	($20,711)	($2,751)	($3,200)	$0	$0	$0	($306,271)

Explanatory Notes: Percent of total AAC savings > 76%

(a) Negative dollar values (in parentheses) denote incremental cost savings relative to conventional RCRA permit baseline; positive values denote additional cost relative to baseline.

(b) OMB "Circular A-94" discount rate applied for computation of net present value (NPV) and average annual equivalent (AAE) over the 30-year period of analysis – 7.00%

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ATTACHMENT B-5

COMPARISON OF BURDEN REDUCTION FOR "STANDARDIZED" RCRA PERMITS TO AVERAGE BURDEN HOURS FOR CONVENTIONAL RCRA PERMITS

I. COMPUTATION OF CONVENTIONAL RCRA PERMIT BURDEN HOURS:

		Legal	Mngrl	Tech	Clerical	Row Totals	1999 ICR reference
Respondent Burden (Eligible TSFs):							
Part A*		3.50	6.00	17.00	5.50	32.00	Source A Exh.1
Part B**	General***	107.00	58.90	522.20	66.80	754.90	Source B Exh 2
	Containers	0.00	2.85	25.75	3.40	32.00	Source B Exh 2
	Tanks	0.00	6.25	42.25	6.00	54.50	Source B Exh 2
	Cont.bldgs	0.00	7.80	64.80	8.80	81.40	Source B Exh 2 ("Misc units")
Modifications	Routine	3.00	2.25	12.00	2.35	19.60	Source B Exh 3
	Significant	7.00	17.00	88.00	13.60	125.60	Source B Exh 3
Renewals		Same as standardized new permit burden.					
Agency Burden (Permitting Authorities):							
Part A*		0.00	0.00	4.25	1.35	5.60	Source A Exh.2
Part B**	General	0.00	1.75	46.75	4.10	52.60	Source B Exh.6
	Containers	0.00	0.00	6.00	0.10	6.10	Source B Exh.6
	Tanks	0.00	0.00	16.00	0.10	16.10	Source B Exh.6
	Cont.bldgs	0.00	0.00	60.00	0.10	60.10	Source B Exh.6 ("Misc units")
Modifications	Routine	0.00	0.75	3.00	0.10	3.85	Source B Exh.7
	Significant	20.00	1.25	41.00	0.10	62.35	Source B Exh.7
Renewals		Same as standardized new permit burden.					

II. VALUATION OF CONVENTIONAL RCRA PERMIT BURDEN HOURS:

		Legal	Mngrl	Tech	Clerical	Row Totals
Respondent Burden (Eligible TSFs):						
	Hourly cost>	$102	$73	$53	$27	
Part A*		$357	$438	$901	$149	$1,845
Part B**	General***	$10,914	$4,300	$27,677	$1,804	$44,694
	Containers	$0	$208	$1,365	$92	$1,665
	Tanks	$0	$456	$2,239	$162	$2,858
	Cont.bldgs	$0	$569	$3,434	$238	$4,241
Modifications	Routine	$306	$164	$636	$63	$1,170
	Significant	$714	$1,241	$4,664	$367	$6,986
Renewals		Same as standardized new permit burden.				
Agency Burden (Permitting Authorities):						
	Hourly cost>	$61	$57	$42	$17	
Part A*		$0	$0	$179	$23	$201
Part B**	General	$0	$100	$1,964	$70	$2,133
	Containers	$0	$0	$252	$2	$254
	Tanks	$0	$0	$672	$2	$674
	Cont.bldgs	$0	$0	$2,520	$2	$2,522
Modifications	Routine	$0	$43	$126	$2	$170
	Significant	$1,220	$71	$1,722	$2	$3,015
Renewals		Same as standardized new permit burden.				

Explanatory Notes:

(a) * Part A burden hours above exclude hours for justification, reauthorization, Subpart H compliance demonstrations.
(b) ** Part B includes both "General" facility burden plus unit-specific burden (i.e. containers, tanks, cont.bldgs).
(c) *** "General" permit burden excludes financial assurance, "other" Part B requirements, GW protection, & SWMUs.
Excluded Part B burden items do not apply equally to all TSFs, and financial assurance is a separate burden item.
Some subitems included in "General" burden hours above may not apply to all TSFs.

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ATTACHMENT B-6

COMPARISON OF BURDEN REDUCTION FOR "STANDARDIZED" PEI				
TO AVERAGE BURDEN HOURS FOR CONVENTIONAL RCRA PERMIT				
III. COMPUTATION OF PERCENTAGE REDUCTION IN HOURS:				
Type of Permit Action		Conventional RCRA Permit	Reduction Provided by Standardized RCRA Permit	Percentage reduction
Respondent Burden (Eligible TSFs):				
New Permits:	Containers	818.90	23.00	3%
	Tanks	841.40	23.00	3%
	Cont.bldgs	868.30	23.00	3%
Modifications	Routine	19.60	2.10	11%
	Significant	125.60	8.10	6%
Renewals		Same as standardized new permit burden.		
Agency Burden (Permit Authorities):				
New Permits:*	Containers	64.30	63.30	98%
	Tanks	74.30	73.30	99%
	Cont.bldgs	118.30	117.30	99%
Modifications	Routine	3.85	0.00	0%
	Significant	62.35	0.00	0%
Renewals		Same as standardized new permit burden.		
Combined Burden:				
New Permits:	Containers	883.20	86.30	10%
	Tanks	915.70	96.30	11%
	Cont.bldgs	986.60	140.30	14%
Modifications	Routine	23.45	2.10	9%
	Significant	187.95	8.10	4%
Renewals		Same as standardized new permit burden.		
IV. COMPUTATION OF PERCENTAGE REDUCTION IN COST:				
Respondent Burden (Eligible TSFs):				
New Permits:	Containers	$48,203	$1,035	2%
	Tanks	$49,396	$1,035	2%
	Cont.bldgs	$50,780	$1,035	2%
Modifications	Routine	$1,170	$109	9%
	Significant	$6,986	$409	6%
Renewals		Same as standardized new permit burden.		
Agency Burden (Permit Authorities):				
New Permits:*	Containers	$2,588	$2,571	99%
	Tanks	$3,008	$2,991	99%
	Cont.bldgs	$4,856	$4,839	100%
Modifications	Routine	$170	$0	0%
	Significant	$3,015	$0	0%
Renewals		Same as standardized new permit burden.		
Combined Burden:				
New Permits:	Containers	$50,791	$3,606	7%
	Tanks	$52,404	$4,026	8%
	Cont.bldgs	$55,636	$5,874	11%
Modifications	Routine	$1,340	$109	8%
	Significant	$10,001	$409	4%
Renewals		Same as standardized new permit burden.		
* Large percentage reduction to permit authorities for new permit actions, reflects savings from not reviewing the Part B permit information which TSFs no longer submit.				
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ATTACHMENT B-7

CLOSURE PLAN FOR "STANDARDIZED" RCRA PERMITS
DIFFERENCE IN DISCOUNTED COST FOR DEFERRED SUBMITTAL

		Period	A. COST TO SINGLE TSF:				B. COST TO FUTURE ELIGIBLE TSFs:				
		of	If TSF	If after	If after	If after	Number	If TSF	If after	If after	If after
	Row item	analysis year	cost is upfront*	10-year lifespan	20-year lifespan	30-year lifespan	new TSFs**	cost is upfront*	10-year lifespan	20-year lifespan	30-year lifespan
Base>	1	2001	$1,128				2	$2,256	$0	$0	
	2	2002					2	$2,256	$0	$0	
	3	2003					2	$2,256	$0	$0	
	4	2004					2	$2,256	$0	$0	
	5	2005					2	$2,256	$0	$0	
	6	2006					2	$2,256	$0	$0	
	7	2007					2	$2,256	$0	$0	
	8	2008					2	$2,256	$0	$0	
	9	2009					2	$2,256	$0	$0	
	10	2010		$1,128			2	$2,256	$2,256	$0	
	11	2011					2	$2,256	$2,256	$0	
	12	2012					2	$2,256	$2,256	$0	
	13	2013					2	$2,256	$2,256	$0	
	14	2014					2	$2,256	$2,256	$0	
	15	2015					2	$2,256	$2,256	$0	
	16	2016					2	$2,256	$2,256	$0	
	17	2017					2	$2,256	$2,256	$0	
	18	2018					2	$2,256	$2,256	$0	
	19	2019					2	$2,256	$2,256	$0	
	20	2020			$1,128		2	$2,256	$2,256	$2,256	
	21	2021					2	$2,256	$2,256	$2,256	
	22	2022					2	$2,256	$2,256	$2,256	
	23	2023					2	$2,256	$2,256	$2,256	
	24	2024					2	$2,256	$2,256	$2,256	
	25	2025					2	$2,256	$2,256	$2,256	
	26	2026					2	$2,256	$2,256	$2,256	
	27	2027					2	$2,256	$2,256	$2,256	
	28	2028					2	$2,256	$2,256	$2,256	
	29	2029					2	$2,256	$2,256	$2,256	
	30	2030				$1,128	2	$2,256	$2,256	$2,256	$2,256
Column totals=			$1,128	$1,128	$1,128	$1,128	60	$67,680	$47,376	$21,816	$2,256
	NPV =		$1,128	$614	$312	$159		$29,954	$14,227	$5,005	$317
	AAE =		$91	$49	$25	$13		$2,414	$1,147	$403	$26
	Delta*** =			($41)	($66)	($78)			($1,267)	($2,011)	($2,388)

Explanatory Notes:

(a) * Closure plan required upfront at time of new permit application under conventional RCRA permits; however, closure plans may be submitted 180 days prior to closure under the standardized permit proposal, rather than upfront.

(b) ** Future average annual stream of two new TSFs based on 1999 USEPA ICR "Source C".

(c) *** Delta = AAE cost savings compared to "Up-front" cost associated with "individual RCRA permits.

(d) "Lifespan" = 10-, 20-, and 30-year lifespans represent alternative possible operating lifespans for RCRA TSFs.

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ATTACHMENT B-8

"STANDARDIZED" RCRA PERMIT PROPOSAL
FINANCIAL ASSURANCE FOR FACILITY CLOSURE
EFFECT OF A SHORTER TRUST FUND** PAY-IN PERIOD

			A. 10-Year Pay-In:						B. 3-Year Pay-In:						
		POA^^		Annual Management Fee^^			Capital Investment Installments^^^				Annual Management Fee^^			Capital Investment Installments^^^		
	Item	Year	Base fee^	Low-end	Median	High-end	Low-end	Median	High-end	Base fee^^	Low-end	Median	High-end	Low-end	Median	High-end
Base>	1	2001	$637	$13	$965	$10,841	$1,814	$56,500	$8,701,208	$637	$47	$2,015	$62,804	$4,380	$188,362	$12,337,362
	2	2002	$0	$26	$1,118	$81,096	$1,183	$50,850	$8,305,179	$0	$95	$4,026	$105,478	$4,227	$174,705	$11,443,520
	3	2003	$0	$39	$1,695	$47,177	$1,172	$50,419	$8,248,670	$0	$131	$8,955	$148,048	$2,743	$129,510	$8,221,122
	4	2004	$0	$54	$2,308	$68,971	$1,150	$49,441	$8,152,221	$0	$131	$8,955	$148,048	($920)	($39,564)	($2,590,846)
	5	2005	$0	$69	$2,947	$81,301	$1,110	$47,746	$8,002,756	$0	$131	$8,955	$148,048	($920)	($39,564)	($2,590,846)
	6	2006	$0	$84	$3,604	$98,895	$1,048	$45,093	$7,781,141	$0	$131	$8,955	$148,048	($920)	($39,564)	($2,590,846)
	7	2007	$0	$99	$4,266	$116,337	$952	$40,997	$7,457,652	$0	$131	$8,955	$148,048	($920)	($39,564)	($2,590,846)
	8	2008	$0	$114	$4,911	$129,311	$805	$34,619	$1,128,705	$0	$131	$8,955	$148,048	($920)	($39,564)	($2,590,846)
	9	2009	$0	$128	$5,697	$138,363	$61	$2,638	$0	$0	$131	$8,955	$148,048	($920)	($39,564)	($2,590,846)
	10	2010	$0	$131	$8,955	$148,048	$0	$0	$0	$0	$131	$8,955	$148,048	($920)	($39,564)	($2,590,846)
	11	2011	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	12	2012	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	13	2013	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	14	2014	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	15	2015	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	16	2016	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	17	2017	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	18	2018	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	19	2019	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	20	2020	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	21	2021	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	22	2022	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	23	2023	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	24	2024	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	25	2025	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	26	2026	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	27	2027	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	28	2028	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	29	2029	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	30	2030	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Non-discounted	totals=		$637	$752	$29,062	$870,341	$8,795	$378,221	$22,777,592	$637	$1,198	$37,684	$1,842,669	$4,911	$211,690	$13,866,082
30-Year POA:	NPV =		$637	$508	$19,992	$589,970	$7,147	$307,852	$18,815,067	$637	$869	$27,851	$977,588	$6,396	$275,065	$18,017,220
	AAE =		$51	$41	$1,611	$47,544	$576	$24,768	$1,516,239	$51	$70	$2,244	$78,780	$515	$22,166	$1,451,943
10-Year POA:	NPV =		$637	$508	$19,992	$589,970	$7,147	$307,852	$18,815,067	$637	$869	$27,851	$977,588	$6,396	$275,065	$18,017,220
	AAE =		$91	$72	$2,846	$83,998	$1,018	$43,760	$2,678,842	$91	$124	$3,965	$139,187	$911	$39,163	$2,565,247

Explanatory Notes:

(a) * Trust funds represent one of seven different types of facility closure financial assurance mechanisms, used by about 12% of RCRA TSDFs.

(b) ** Base fee is an initial administrative cost only in the first year to set up the trust fund (from ICF "Source C" Exhibit 8).

(c) *** Annual management fee is variable in relation to cumulative value of trust fund.

Fee		Cumulative Value
1.0%	->	$500,000
0.7%	->	$1,000,000
0.5%	->	$1,500,000
0.4%	->	$1,500,000 (Source: "Financial Responsibility for Hazardous Waste Facilities", ICF Inc., 09 Nov 1993, p.9.)

(d) **** Capital investment installments (annual payments) based on two components:

(1) TSF closure financial assurance trustfund payment formula required by 40 CFR 264.143(a)(3) & 265.143(a)(3) for interim status TSFs.

(2) 15 Oct 1996 USEPA Region 4 study containing facility closure cost estimates made by a non random sample of 100 TSDF owners/operators between 1988-1995 (Table 1, p.7):

Negative installment values indicate annual pay out to TSF generated by annual interest earned (at OMB discount rate) on previous year's trustfund cumulative value.

Annual interest payout possible when cumulative value of trustfund exceeds closure cost estimate, upon written request (40 CFR 264.143(a)(7)) & 265.143(a)(7) for interim status TSFs).

The following inflation adjusted closure cost estimates are used above as trustfund investment total pay in target values (although high end value may not apply to eligible TSFs):

	($1994)	($1999)
Low end	$11,697	$13,139
Median	$500,025	$565,055
High end	$32,949,040	$37,012,085

Closure cost inflation update factor ($1999/$1994) is based on the Engineering News Record magazine "Construction Cost Index" for the USA = 1.123

(e) Discount rate for computation of net present value (NPV) and average annual equivalent (AAE) over the period of analysis = 7.00%

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Difference Between Pay-In Periods Based on Median Closure Cost Estimate:

	Less	Funding	Total
30 Year POA:			
NPV =	$7,659	($32,286)	($24,428)
AAE =	$633	($2,602)	($1,969)
10 Year POA:			
NPV =	$7,659	($32,286)	($24,428)
AAE =	$1,119	($4,597)	($3,479)

ATTACHMENT B-9

"STANDARDIZED" RCRA PERMIT PROPOSAL
FINANCIAL ASSURANCE FOR FACILITY CLOSURE
COMPUTATION OF ANNUAL PAY-IN INVESTMENT

		I. YEAR-END INVESTMENT CUMULATIVE VALUE:						II. REMAINING CLOSURE COST TO FUND AT YEAR-END:					
	POA**	A. 10-Year Pay-In:			B. 3-Year Pay-In:			A. 10-Year Pay-In:			B. 3-Year Pay-In:		
Item	Year	Low-end	Median	High-end	Low-end	Median	High-end	Low-end	Median	High-end	Low-end	Median	High-end
1	2001	$1,314	$56,505	$3,960,293	$4,686	$201,536	$13,200,977	$11,825	$508,549	$33,051,792	$8,453	$363,518	$23,811,108
2	2002	$2,588	$111,316	$7,774,055	$9,537	$402,578	$26,369,611	$10,551	$453,739	$29,238,030	$3,603	$162,476	$10,642,473
3	2003	$3,942	$169,523	$11,794,316	$13,139	$565,055	$37,012,085	$9,197	$395,531	$25,217,769	$0	$0	$0
4	2004	$5,368	$230,831	$15,992,795	$13,139	$565,055	$37,012,085	$7,772	$334,223	$21,019,290	$0	$0	$0
5	2005	$6,854	$294,736	$20,325,239	$13,139	$565,055	$37,012,085	$6,286	$270,319	$16,686,846	$0	$0	$0
6	2006	$8,381	$360,420	$24,723,827	$13,139	$565,055	$37,012,085	$4,758	$204,634	$12,288,258	$0	$0	$0
7	2007	$9,919	$426,577	$29,084,182	$13,139	$565,055	$37,012,085	$3,220	$138,478	$7,927,903	$0	$0	$0
8	2008	$11,419	$491,056	$32,327,788	$13,139	$565,055	$37,012,085	$1,721	$73,998	$4,684,296	$0	$0	$0
9	2009	$12,279	$528,089	$34,590,734	$13,139	$565,056	$37,012,085	$860	$36,966	$2,421,351	$0	$0	$0
10	2010	$13,139	$565,055	$37,012,085	$13,139	$565,055	$37,012,085	$0	$0	$0	$0	$0	$0
11	2011												
12	2012												
13	2013												
14	2014												
15	2015												
16	2016												
17	2017												
18	2018												
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ATTACHMENT B-10

FINANCIAL TEST FOR "STANDARDIZED" RCRA PERMITS SAVINGS FOR NOT REQUIRING A CPA REPORT

	Row item	Period of analysis year	Average annual eligible new TSFs^	Average % using financial test^^	Average annual applicable TSFs	Average annual cost savings
Base=>	1	2001	2	45%	0.9	$222
	2	2002	2	45%	0.9	$222
	3	2003	2	45%	0.9	$222
	4	2004	2	45%	0.9	$222
	5	2005	2	45%	0.9	$222
	6	2006	2	45%	0.9	$222
	7	2007	2	45%	0.9	$222
	8	2008	2	45%	0.9	$222
	9	2009	2	45%	0.9	$222
	10	2010	2	45%	0.9	$222
	11	2011	2	45%	0.9	$222
	12	2012	2	45%	0.9	$222
	13	2013	2	45%	0.9	$222
	14	2014	2	45%	0.9	$222
	15	2015	2	45%	0.9	$222
	16	2016	2	45%	0.9	$222
	17	2017	2	45%	0.9	$222
	18	2018	2	45%	0.9	$222
	19	2019	2	45%	0.9	$222
	20	2020	2	45%	0.9	$222
	21	2021	2	45%	0.9	$222
	22	2022	2	45%	0.9	$222
	23	2023	2	45%	0.9	$222
	24	2024	2	45%	0.9	$222
	25	2025	2	45%	0.9	$222
	26	2026	2	45%	0.9	$222
	27	2027	2	45%	0.9	$222
	28	2028	2	45%	0.9	$222
	29	2029	2	45%	0.9	$222
	30	2030	2	45%	0.9	$222
Column totals=			60		27	$6,669
	NPV =					$2,952
	AAE =					$238

Explanatory Notes:

(a) * Average annual eligible new TSFs obtaining a standardized permit from ICR "Source C".

(b) ** Percent of eligible new TSFs using a financial test or corporate guarantee financial assurance mechanism for TSF closure, based on 1996 USEPA Region 4 study of 100 TSFs.

(c) Assumed average burden cost reduction per permit action based on the same burden as preparation and submittal of a CFO letter (from ICR "Source C" Exhibit 8) = $247

(d) NPV and AAE computed using the OMB prescribed discount rate = 7.00%

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ATTACHMENT C

SENSITIVITY ANALYSES:

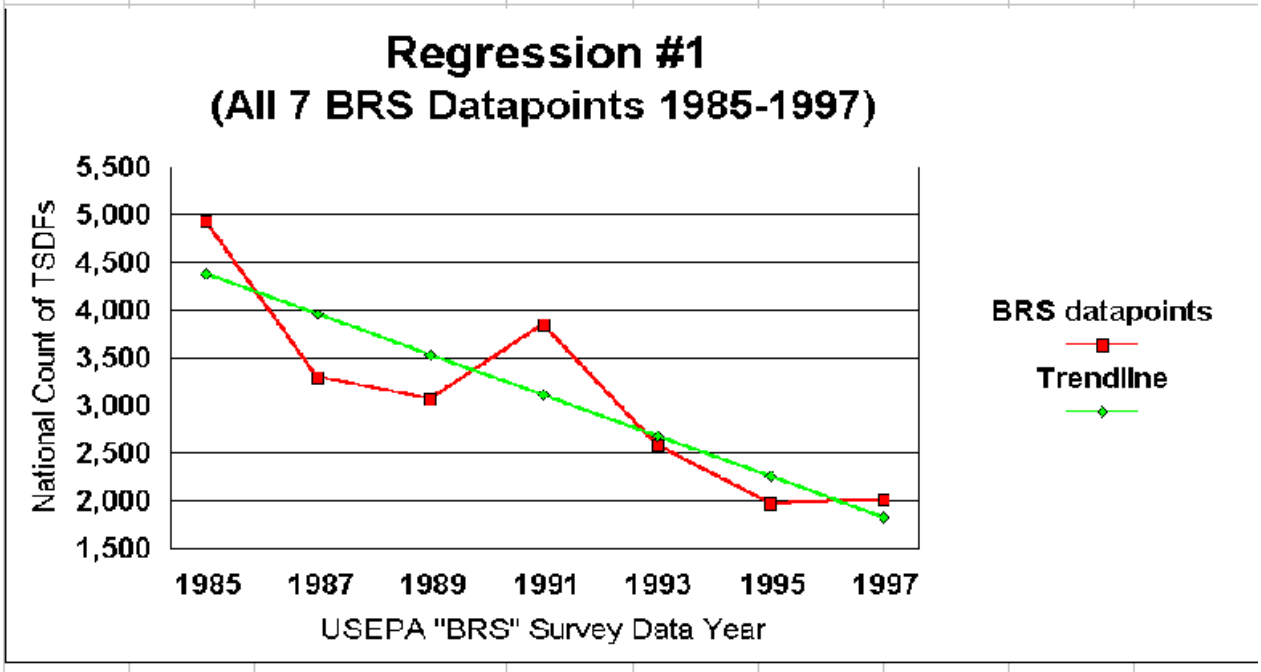
– DISCOUNT RATE

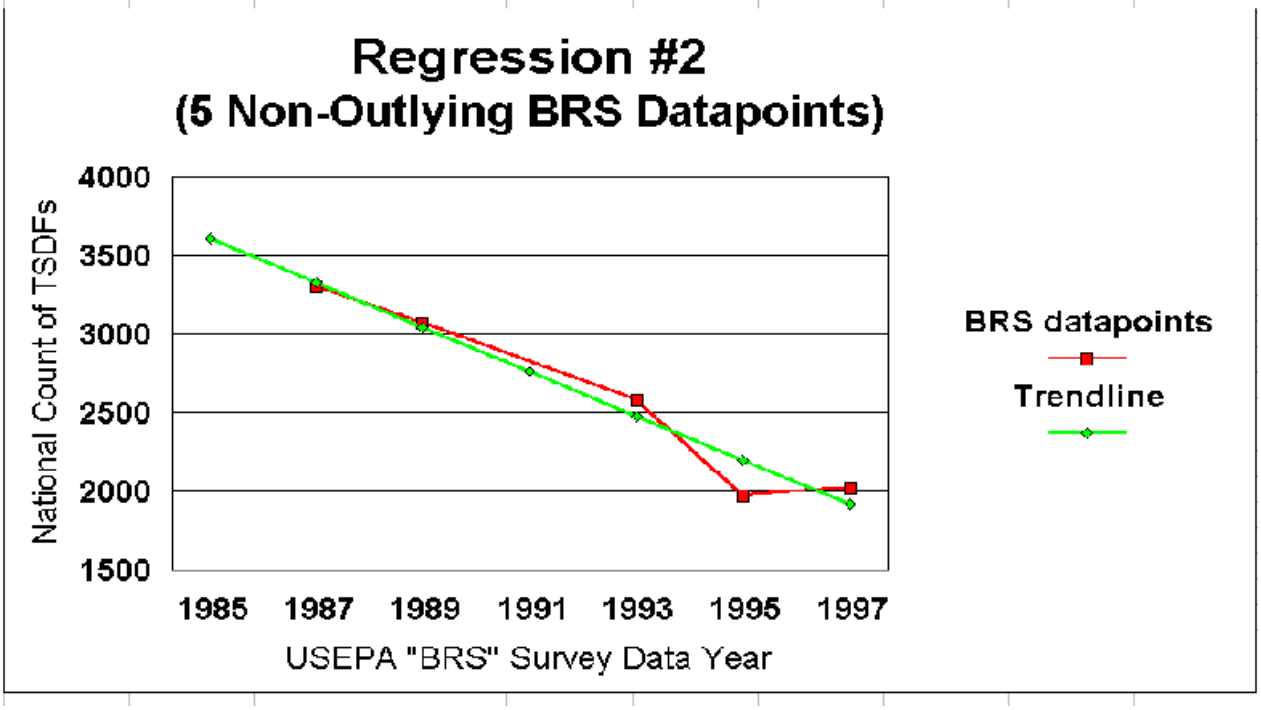
– PERIOD-OF-ANALYSIS

– FORECAST OF FUTURE ELIGIBLE TSFs

ATTACHMENT C-1

SIMPLE LINEAR REGRESSION OF TSDF UNIVERSE DATA
1985-1997 USEPA BIENNIAL REPORTING SYSTEM (BRS)





ATTACHMENT C-2

LINEAR REGRESSION #1 (ALL 7 BRS DATAPOINTS)							LINEAR REGRESSION #2 (5 NON-OUTLYING BRS DATAPOINT					
Data item	Period of analysis (years)	BRS Data Year	BRS Universe of RCRA TSDFs*	Linear Regression Trend Line	Linear Regression Output:		BRS Data Year	BRS Universe of RCRA TSDFs*	Linear Regression Trend Line	Linear Regression Output:		Percent outlying #1 data from #2 trend value
1	-16	1985	4,944	4,387	Constant	426,235	1985		3,612	Constant	283,809	21%
2	-14	1987	3,308	3,962	Std Err of Y Est	571.8	1987	3,308	3,330	Std Err of Y Est	153.1	
3	12	1989	3,078	3,537	R Squared	0.756	1989	3,078	3,047	R Squared	0.951	
4	-10	1991	3,862	3,112	No. of Observations	7	1991		2,765	No. of Observations	5	13%
5	-8	1993	2,584	2,687	Degrees of Freedom	5	1993	2,584	2,483	Degrees of Freedom	3	
6	-6	1995	1,983	2,262	X Coefficient(s)	-212.5	1995	1,983	2,200	X Coefficient(s)	-141.2	
7	-4	1997	2,025	1,837	Std Err of Coef.	54.0	1997	2,025	1,918	Std Err of Coef.	18.5	
	-2	1999		1,412			1999		1,636			
Base>	1	2001		987	X= year (indep variable)		2001		1,353	X= year (indep variable)		
	3	2003		562	Y= TSF variable (dep variable)		2003		1,071	Y= TSF variable (dep variable)		
	5	2005		137			2005		789			
	7	2007		0			2007		506			
	9	2009					2009		224			
	11	2011					2011		0			
	13	2013					2013					
	15	2015					2015					
	17	2017					2017					
	19	2019					2019					
	21	2021					2021					
	23	2023					2023					
	25	2025					2025					
	27	2027					2027					
	29	2029					2029					
	31	2031					2031					
(a)	Source: USEPA Office of Solid Waste, "Biennial Reporting System" (BRS) national survey database.											
(b)	TSDFs = Treatment, storage and disposal facilities, as defined by the USEPA Office of Solid Waste "Resource Conservation & Recovery Act" (RCRA).											
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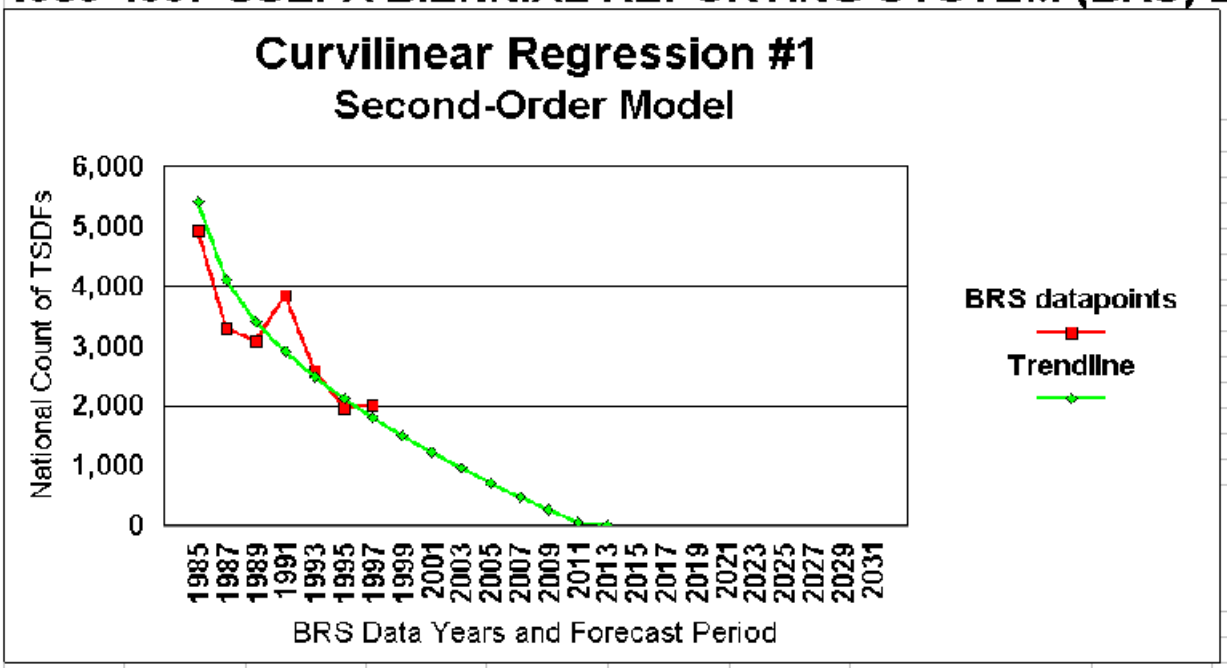
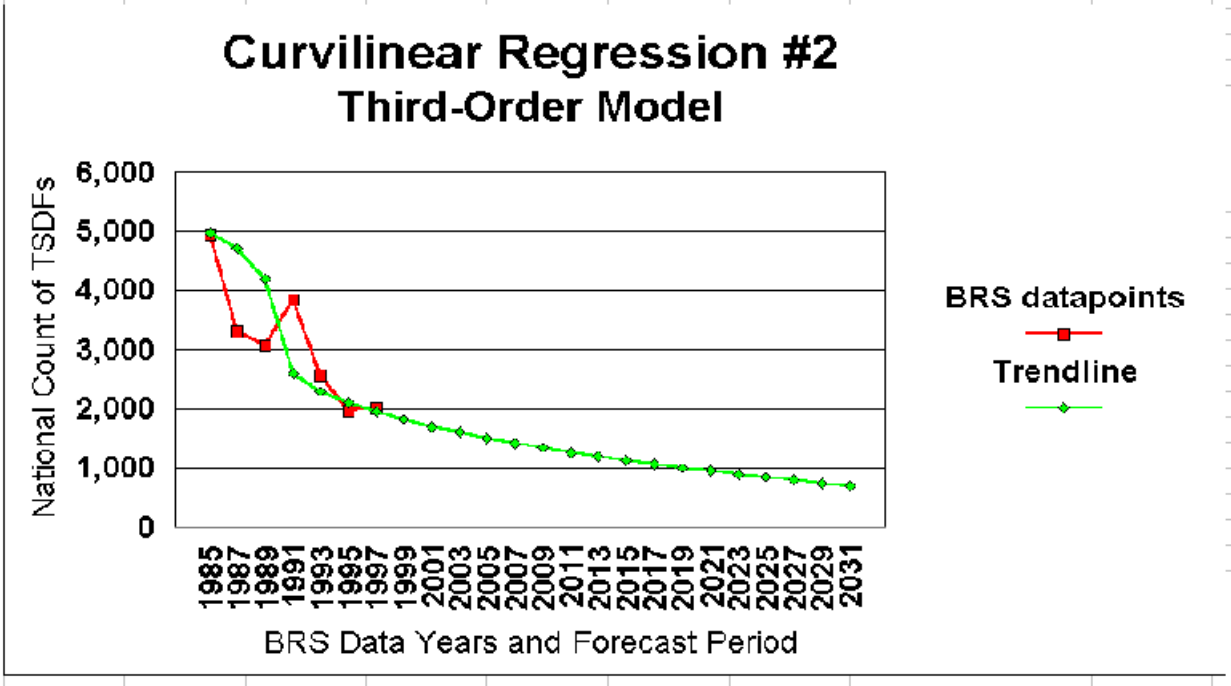
ATTACHMENT C-3

CURVILINEAR REGRESSION OF TSDF UNIVERSE DATA
1985-1997 USEPA BIENNIAL REPORTING SYSTEM (BRS) DATA





ATTACHMENT C-4

CURVILINEAR REGRESSION #1 (SECOND-ORDER) (ALL 7 BRS DATAPOINTS)

Data item	Period of analysis (years)	Indep BRS Universe of RCRA TSDFs	2nd ind varbl curvilinear term (X squared)	Dep variable BRS Data Year	Backsolver Regression fit trendline	Backsolver formula	Curvilinear Regression Output:		
1	-16	4,944	2.44E-007	1985	5,109	1986		1st variable	2nd variable
2	-14	3,308	1.09E-007	1987	4,104	1987			
3	-12	3,078	9.47E-008	1989	3,412	1989	Constant		2,012
4	-10	3,862	1.49E-007	1991	2,908	1991	Std Err of Y Est		2.36
5	8	2,584	6.68E-008	1993	2,402	1993	R Squared		0.801
6	-6	1,983	3.93E-008	1995	2,129	1995	No. of Observations		7
7	-4	2,025	4.10E-008	1997	1,902	1997	Degrees of Freedom		4
	2			1999	1,504	1999	X Coefficient(s)	0.00969	0.0000009
Base:	1			2001	1,227	2001	Std Err of Coef.	0.0064715	0.0000009
	3			2003	967	2003			
	5			2005	722	2005	X= Inpendent TSDF variables		
	7			2007	489	2007	Y=Year (Dependent variable)		
	9			2009	267	2009			
	11			2011	55	2011			
	13			2013	0	2012			
	15			2015		2012			
	17			2017		2012			
	19			2019		2012			
	21			2021		2012			
	23			2023		2012			
	25			2025		2012			
	27			2027		2012			
	29			2029		2012			
	31			2031		2012			

CURVILINEAR REGRESSION #2 (THIRD-ORDER) (ALL 7 BRS DATAPOINTS)

Data item	Period of analysis (years)	Indep BRS Universe of RCRA TSDFs	2nd ind varbl curvilinear term (X squared)	3rd ind varbl curvilinear term (X cubed)	Dep variable BRS Data Year	Backsolver Regression fit trendline	Annual % change	Back-solver formula	Curvilinear Regression Output:			
1	-16	4,944	2.44E-007	1.21E+011	1985	4,965		1985				
2	-14	3,308	1.09E-007	3.62E+010	1987	4,715	-5.0%	1987		1st variable	2nd variable	3rd variable
3	-12	3,078	9.47E-008	2.92E+010	1989	4,203	-10.9%	1989	Constant			2,070
4	-10	3,862	1.49E-007	5.76E+010	1991	2,598	-38.2%	1991	Std Err of Y Est			2.30
5	8	2,584	6.68E-008	1.73E+010	1993	2,304	11.3%	1993	R Squared			0.859
6	-6	1,983	3.93E-008	7.80E+009	1995	2,104	-8.7%	1995	No. of Observations			7
7	-4	2,025	4.10E-008	8.30E+009	1997	1,948	-7.4%	1997	Degrees of Freedom			3
	2				1999	1,816	6.7%	1999	X Coefficient	0.057134	0.0000187	1.7E-009
Base:	1				2001	1,702	-6.3%	2001	Std Err of Co	0.0522942	0.0000161	1.56E-009
	3				2003	1,600	-6.0%	2003				
	5				2005	1,507	-5.8%	2005	X= Inpendent TSDF variables			
	7				2007	1,422	-5.6%	2007	Y=Year (Dependent variable)			
	9				2009	1,344	-5.5%	2009				
	11				2011	1,270	-5.5%	2011				
	13				2013	1,201	-5.4%	2013				
	15				2015	1,135	-5.4%	2015				
	17				2017	1,073	-5.5%	2017				
	19				2019	1,014	-5.5%	2019				
	21				2021	958	-5.6%	2021				
	23				2023	903	-5.7%	2023				
	25				2025	851	-5.8%	2025				
	27				2027	801	-5.9%	2027				
	29				2029	752	-6.1%	2029				
	31				2031	706	-6.2%	2031				
				Average annual % change 2001 to 2031 =			-2.89%					02.04.00

ATTACHMENT C-5

SENSITIVITY ANALYSIS:

EFFECT OF FUTURE ANNUAL PERMIT ACTIONS ON ESTIMATED NATIONAL COST SAVINGS FOR THE "STANDARDIZED" RCRA PERMIT

Alternative Future Permit Action Scenarios & Estimated Cost Savings

			A. BASE CASE:**		B. ALTERNATIVE FUTURE SCENARIOS:***					
					B1.Declining Scenario:			B2. Growth Scenario:		
		POA*	Annual permit	Base case annual	Average	Resultant	Modified	Average	Resultant	Modified
	Item	Year	actions	savings	% change**	actions	savings	% change**	actions	savings
Base>	1	2001	200	($351,246)	-2.9%	194	($341,087)	2.9%	206	($361,405)
	2	2002	200	($351,246)	-2.9%	194	($341,087)	2.9%	206	($361,405)
	3	2003	200	($351,246)	-2.9%	194	($341,087)	2.9%	206	($361,405)
	4	2004	200	($351,246)	-2.9%	194	($341,087)	2.9%	206	($361,405)
	5	2005	200	($351,246)	-2.9%	194	($341,087)	2.9%	206	($361,405)
	6	2006	159	($372,371)	-2.9%	154	($361,601)	2.9%	164	($383,141)
	7	2007	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	8	2008	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	9	2009	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	10	2010	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	11	2011	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	12	2012	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	13	2013	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	14	2014	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	15	2015	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	16	2016	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	17	2017	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	18	2018	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	19	2019	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	20	2020	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	21	2021	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	22	2022	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	23	2023	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	24	2024	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	25	2025	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	26	2026	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	27	2027	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	28	2028	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	29	2029	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
	30	2030	121	($391,951)	-2.9%	118	($380,614)	2.9%	124	($403,287)
Non-discounted totals=			4063	($11,535,415)		3945	($11,201,760)		4181	($11,869,049)
		NPV =		($5,011,652)			($4,866,702)			($5,156,602)
		AAE =		($403,871)			($392,190)			($415,562)

Explanatory Notes:

(a) * POA = Period-of-analysis = Stream of future years within scope of economic analysis.

(b) ** "Base case" = Scenario based on constant future annual permit actions (except for phase-out of limited conversion cases).

(c) Discount rate for computation of net present value (NPV) and average annual equivalent (AAE) over the POA = 7.00%

(d) *** For description of alternative future annual permit scenarios, refer to the text of the "Economics Background Document".
All three scenarios above (A, B1, B2) portray a uniform annual stream of permit actions, which is a simplification compared to the underlying cycling pattern exhibited by the historical data (1981-1999), reflecting the 10-year permit validation period.

(e) C:\myfiles\StndPrmt\StndPrmt.123 USEPA-OSW-EMRAD 02/29/00

ATTACHMENT C-6

EMPLOYMENT COST INDEX (United States 1983-1999)
12-Month Percentage Change (Quarterly & Annual Basis)

		A. State & Local Govt:					B. Private Industry:				
Item	Year	Qtr1	Qrt2	Qrt3	Qrt4	Annual Average^	Qtr1	Qrt2	Qrt3	Qrt4	Annual Average^
1	1983	7.2%	7.4%	5.7%	5.8%	6.5%	6.5%	6.6%	6.3%	6.4%	6.5%
2	1984	6.3%	6.3%	6.8%	6.8%	6.6%	6.4%	6.3%	5.0%	5.1%	5.7%
3	1985	6.5%	6.3%	6.1%	5.8%	6.2%	4.9%	4.7%	5.3%	4.9%	5.0%
4	1986	5.7%	5.8%	5.4%	5.3%	5.6%	4.4%	4.3%	3.6%	3.5%	4.0%
5	1987	5.1%	4.9%	4.3%	4.6%	4.7%	3.7%	3.4%	3.7%	3.7%	3.6%
6	1988	5.1%	5.2%	5.5%	5.9%	5.4%	3.6%	4.3%	4.5%	5.0%	4.4%
7	1989	5.9%	6.0%	6.8%	6.4%	6.3%	5.3%	5.2%	5.4%	5.2%	5.3%
8	1990	6.6%	6.7%	6.1%	6.0%	6.4%	5.3%	5.5%	5.2%	4.9%	5.2%
9	1991	5.7%	5.2%	3.9%	3.3%	4.5%	4.7%	4.5%	4.4%	4.5%	4.5%
10	1992	2.9%	3.1%	3.4%	3.8%	3.3%	4.0%	3.5%	3.3%	3.3%	3.5%
11	1993	3.6%	3.3%	2.9%	2.5%	3.1%	3.5%	3.6%	3.7%	3.7%	3.6%
12	1994	2.6%	2.8%	2.8%	3.0%	2.8%	3.5%	3.6%	3.4%	3.2%	3.4%
13	1995	2.9%	3.0%	3.0%	2.9%	3.0%	3.1%	3.0%	2.8%	2.8%	2.9%
14	1996	2.7%	2.6%	2.5%	2.6%	2.6%	3.0%	3.0%	3.2%	3.2%	3.1%
15	1997	2.5%	2.4%	2.3%	2.3%	2.4%	3.2%	3.2%	3.1%	3.8%	3.3%
16	1998	2.4%	2.4%	2.7%	2.8%	2.6%	3.8%	4.0%	4.1%	3.9%	4.0%
17	1999	2.7%	2.9%	3.0%	3.4%	3.0%	3.1%	3.4%	3.2%	3.5%	3.3%

Explanatory Notes:

(a) Data source: US Department of Labor, Bureau of Labor Statistics:
http://stats.bls.gov/ecthome.htm (Employment Cost Index "Selective Access" data).

(b) * Annual average shown above computed as simple average of four quarter data within each year.

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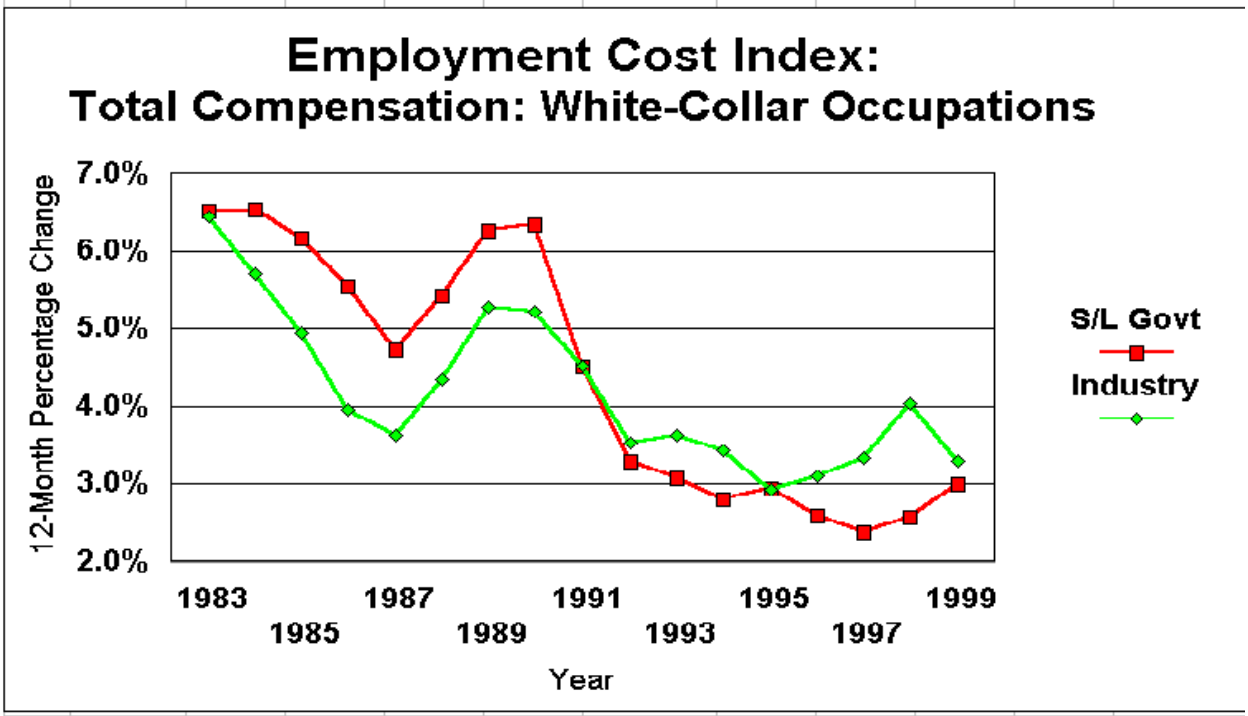
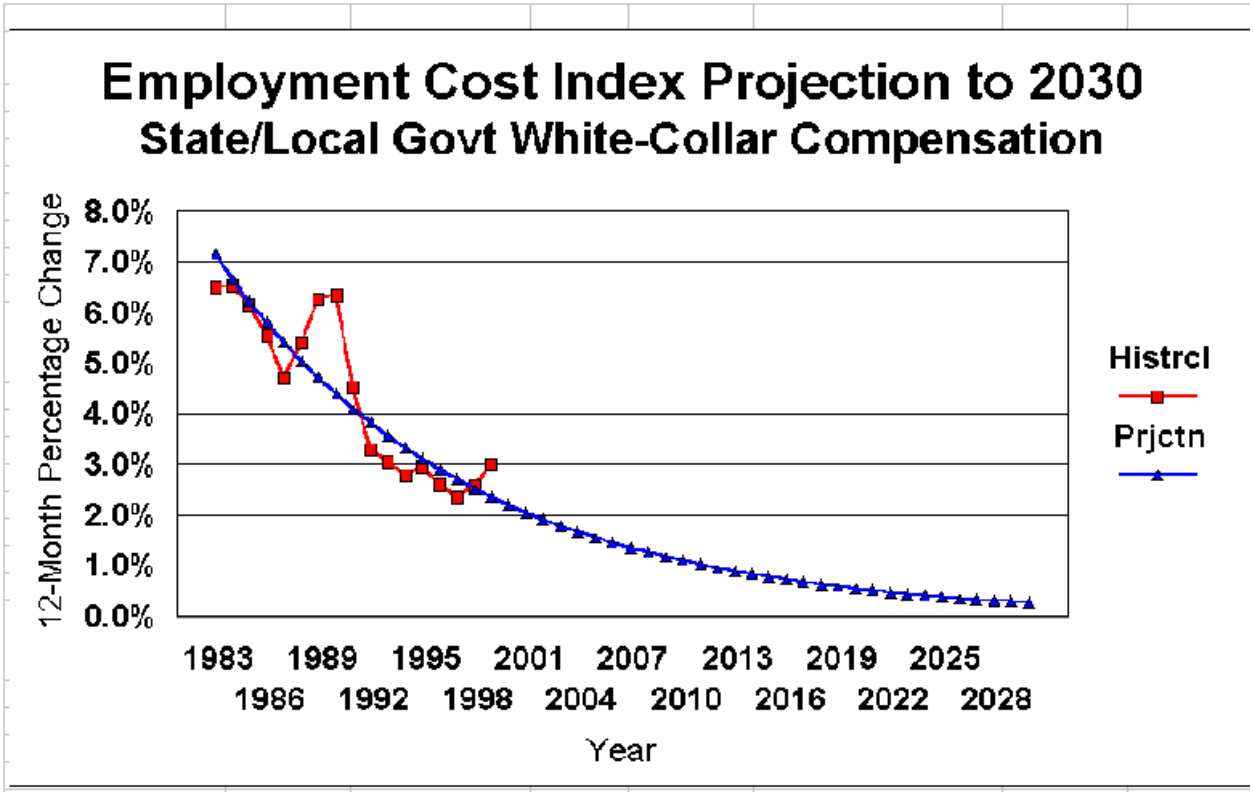


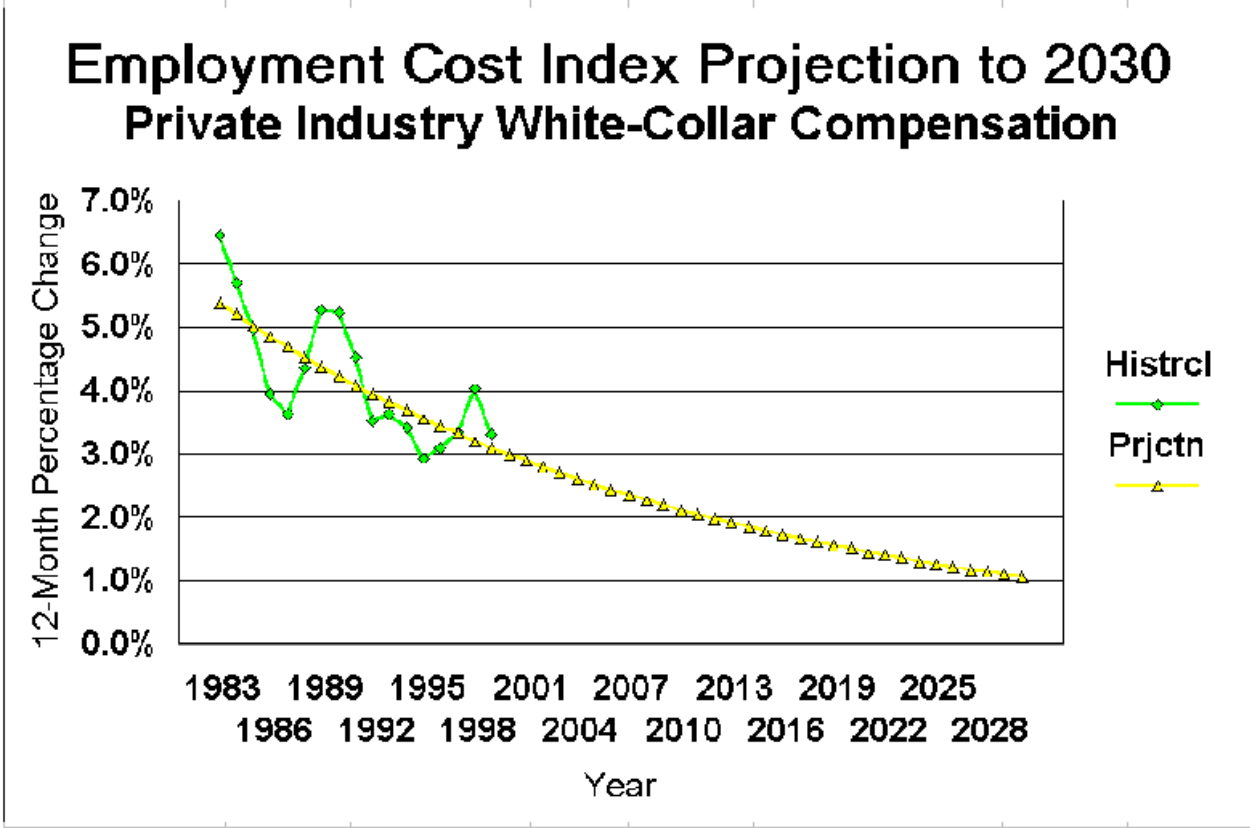
ATTACHMENT C-7

EMPLOYMENT COST INDEX (United States 1983-1999)
12-Month Percentage Change (Quarterly & Annual Basis)
REGRESSION ANALYSIS RESULTS

Regression Outpu	S/L Govt	Industry	Item	Year	R1-% S/L Govt	R1-% Industry	R2-% S/L Govt	R2-% Industry
R1. First-Order (% change):			1	1983	6.7%	5.4%	7.1%	5.4%
Constant	5.80	3.04	2	1984	6.4%	5.2%	6.7%	5.2%
Std Err of Y Est	0.0074086	0.0069091	3	1985	6.1%	5.1%	6.2%	5.0%
R Squared	0.806	0.564	4	1986	5.8%	4.9%	5.8%	4.9%
No. of Observations	17	17	5	1987	5.6%	4.8%	5.4%	4.7%
Degrees of Freedom	15	15	6	1988	5.3%	4.6%	5.1%	4.5%
X Coefficient(s)	-0.002892	-0.001507	7	1989	5.0%	4.5%	4.7%	4.4%
Std Err of Coef.	0.0003668	0.0003421	8	1990	4.7%	4.3%	4.4%	4.2%
			9	1991	4.4%	4.2%	4.1%	4.1%
R2. First-Order Natural Log (% chang			10	1992	4.1%	4.0%	3.8%	3.9%
Constant	134.55	65.68	11	1993	3.8%	3.9%	3.6%	3.8%
Std Err of Y Est	0.1685241	0.156382	12	1994	3.5%	3.7%	3.3%	3.7%
R Squared	0.821	0.571	13	1995	3.2%	3.6%	3.1%	3.6%
No. of Observations	17	17	14	1996	3.0%	3.4%	2.9%	3.4%
Degrees of Freedom	15	15	15	1997	2.7%	3.3%	2.7%	3.3%
X Coefficient(s)	-0.06918	-0.034596	16	1998	2.4%	3.1%	2.5%	3.2%
Std Err of Coef.	0.0083432	0.0077421	17	1999	2.1%	3.0%	2.4%	3.1%
			18	2000	1.8%	2.8%	2.2%	3.0%
			19	2001	1.5%	2.7%	2.1%	2.9%
			20	2002	1.2%	2.5%	1.9%	2.8%
			21	2003	0.9%	2.4%	1.8%	2.7%
			22	2004	0.6%	2.2%	1.7%	2.6%
			23	2005	0.3%	2.1%	1.6%	2.5%
			24	2006	0.1%	1.9%	1.5%	2.4%
			25	2007	-0.2%	1.8%	1.4%	2.3%
			26	2008	-0.5%	1.6%	1.3%	2.3%
			27	2009	0.8%	1.5%	1.2%	2.2%
			28	2010	1.1%	1.3%	1.1%	2.1%
			29	2011	1.4%	1.2%	1.0%	2.0%
			30	2012	1.7%	1.0%	1.0%	2.0%
			31	2013	-2.0%	0.9%	0.9%	1.9%
			32	2014	-2.3%	0.7%	0.8%	1.8%
			33	2015	-2.5%	0.6%	0.8%	1.8%
			34	2016	-2.8%	0.4%	0.7%	1.7%
			35	2017	-3.1%	0.3%	0.7%	1.7%
			36	2018	-3.4%	0.1%	0.6%	1.6%
			37	2019	-3.7%	-0.0%	0.6%	1.6%
			38	2020	-4.0%	-0.2%	0.6%	1.5%
			39	2021	-4.3%	-0.3%	0.5%	1.4%
			40	2022	-4.6%	-0.5%	0.5%	1.4%
			41	2023	-4.9%	-0.6%	0.4%	1.4%
			42	2024	-5.1%	-0.8%	0.4%	1.3%
			43	2025	-5.4%	-0.9%	0.4%	1.3%
			44	2026	-5.7%	-1.1%	0.4%	1.2%
			45	2027	-6.0%	-1.2%	0.3%	1.2%
			46	2028	-6.3%	-1.4%	0.3%	1.1%
			47	2029	6.6%	1.5%	0.3%	1.1%
			48	2030	6.9%	1.7%	0.3%	1.1%

ATTACHMENT C-8





ATTACHMENT C-9

EMPLOYMENT COST INDEX (United States 1983-1999)
12-Month Index Change (Quarterly & Annual Basis)

		A. State & Local Govt:					B. Private Industry:				
Item	Year	Qtr1	Qrt2	Qrt3	Qrt4	Annual Average*	Qtr1	Qrt2	Qrt3	Qrt4	Annual Average*
1	1983	71.1	71.4	73.8	74.5	72.7	75.0	76.0	77.5	78.4	76.7
2	1984	75.6	75.9	78.8	79.6	77.5	79.8	80.8	81.4	82.4	81.1
3	1985	80.5	80.7	83.6	84.2	82.3	83.7	84.6	85.7	86.4	85.1
4	1986	85.1	85.4	88.1	88.7	86.8	87.4	88.2	88.8	89.4	88.5
5	1987	89.4	89.6	91.9	92.8	90.9	90.6	91.2	92.1	92.7	91.7
6	1988	94.0	94.3	97.0	98.3	95.9	93.9	95.1	96.2	97.3	95.6
7	1989	99.5	100.0	103.6	104.6	101.9	98.9	100.0	101.4	102.4	100.7
8	1990	106.1	106.7	109.9	110.9	108.4	104.1	105.5	106.7	107.4	105.9
9	1991	112.2	112.3	114.2	114.6	113.3	109.0	110.3	111.4	112.2	110.7
10	1992	115.4	115.8	118.1	118.9	117.1	113.4	114.2	115.1	115.9	114.7
11	1993	119.5	119.6	121.5	121.9	120.6	117.4	118.3	119.4	120.2	118.8
12	1994	122.6	122.9	124.9	125.5	124.0	121.5	122.5	123.5	124.1	122.9
13	1995	126.2	126.6	128.6	129.1	127.6	125.3	126.2	127.0	127.6	126.5
14	1996	129.6	129.9	131.8	132.5	131.0	129.0	130.0	131.1	131.7	130.5
15	1997	132.9	133.0	134.8	135.5	134.1	133.1	134.1	135.2	136.7	134.8
16	1998	136.1	136.2	138.4	139.3	137.5	138.1	139.4	141.1	142.0	140.2
17	1999	139.8	140.2	142.6	144.0	141.7	142.4	144.1	145.6	146.9	144.8

Explanatory Notes:

(a) Data source: US Department of Labor, Bureau of Labor Statistics:
http://stats.bls.gov/ecthome.htm (Employment Cost Index "Selective Access" data).

(b) * Annual average shown above computed as simple average of four quarter data within each year.

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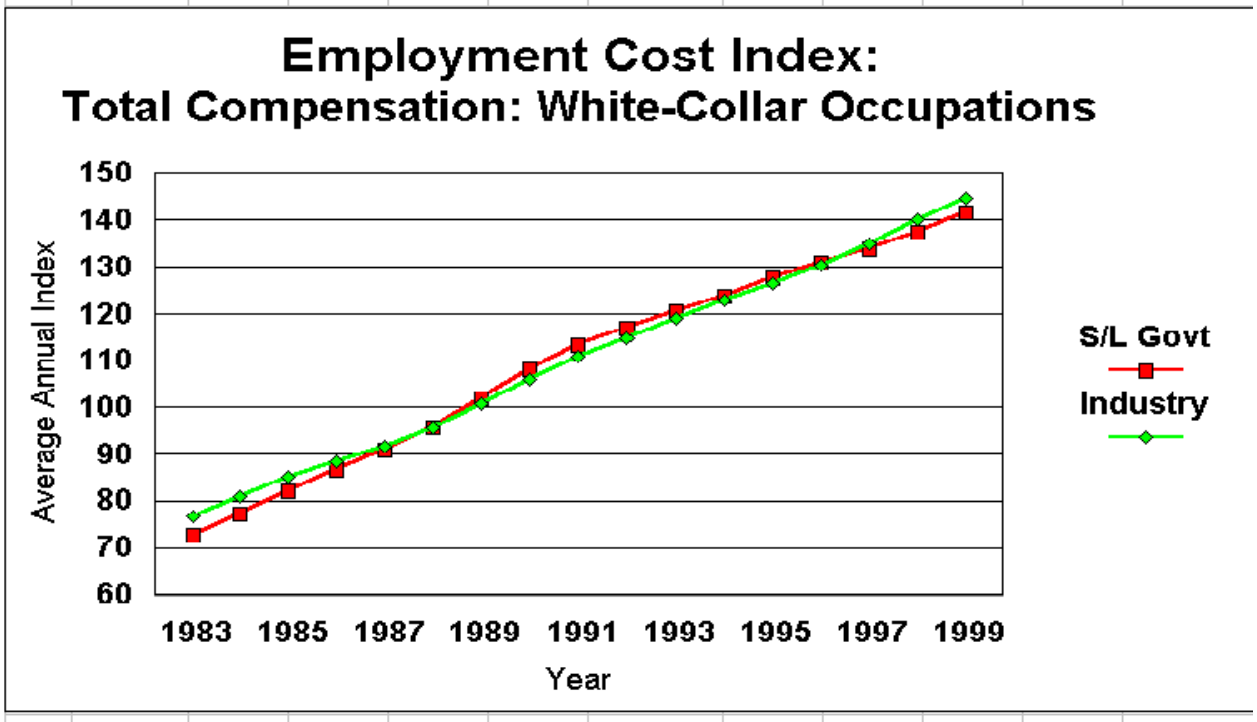


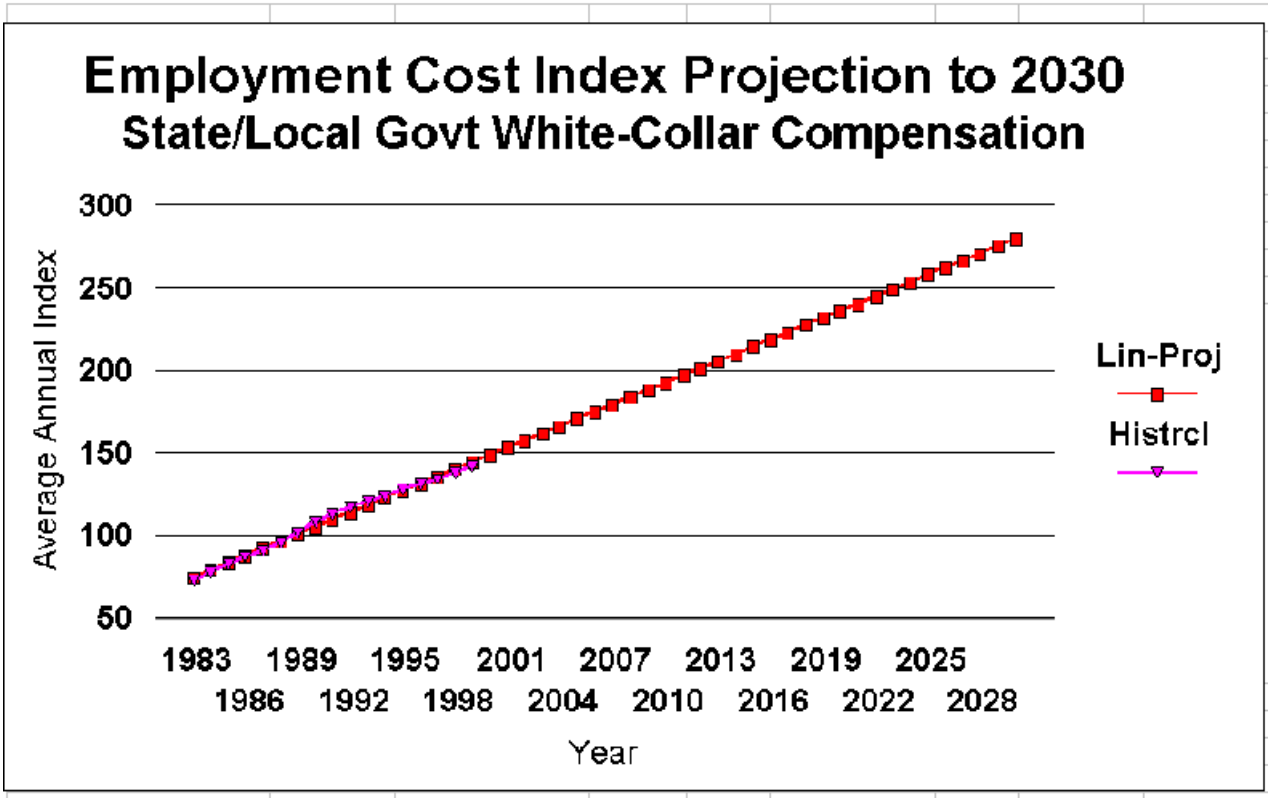
ATTACHMENT C-10

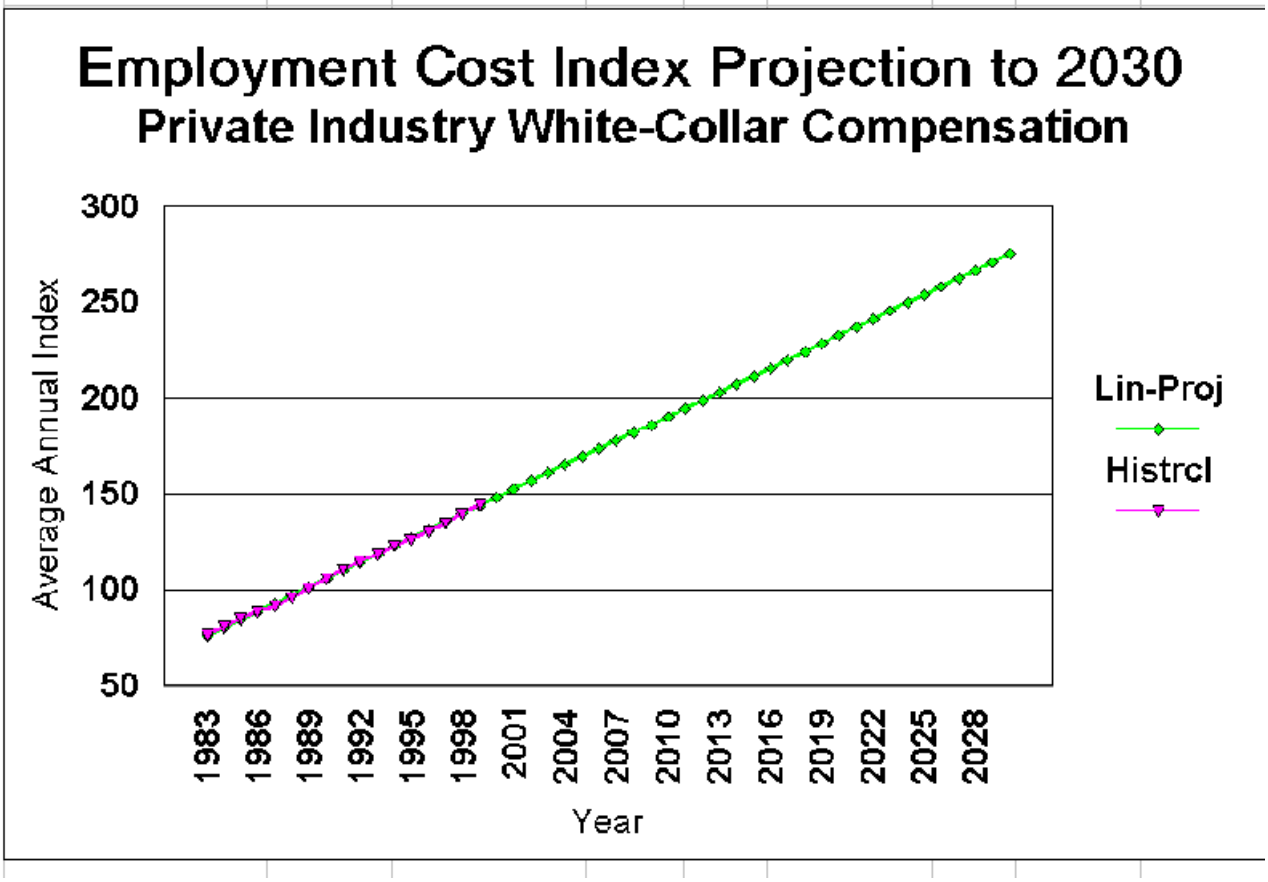
EMPLOYMENT COST INDEX (United States 1983-1999)
12-Month Index Change (Quarterly & Annual Basis)
REGRESSION ANALYSIS RESULTS

Regression Output:	S/L Govt	Industry
R1. First-Order (Indx):		
Constant	-8577.97	-8341.805
Std Err of Y Est	2.1719635	0.8054347
R Squared	0.991	0.999
No. of Observations	17	17
Degrees of Freedom	15	15
X Coefficient(s)	4.3634191	4.2449755
Std Err of Coef.	0.1075282	0.039875
R2. First-Order Natural Log (Indx):		
Constant	77.68352	73.70054
Std Err of Y Est	0.0372471	0.0159485
R Squared	0.971	0.994
No. of Observations	17	17
Degrees of Freedom	15	15
X Coefficient(s)	0.0413661	0.0393682
Std Err of Coef.	0.001844	0.0007896

Item	Year	R1-Indx S/L Govt	R1-Indx Industry	R2-Indx S/L Govt	R2-Indx Industry
1	1983	74.7	76.0	77.1	78.8
2	1984	79.1	80.2	80.4	81.9
3	1985	83.4	84.5	83.8	85.2
4	1986	87.8	88.7	87.3	88.6
5	1987	92.1	93.0	91.0	92.2
6	1988	96.5	97.2	94.8	95.9
7	1989	100.9	101.5	98.9	99.8
8	1990	105.2	105.7	103.0	103.8
9	1991	109.6	109.9	107.4	107.9
10	1992	114.0	114.2	111.9	112.3
11	1993	118.3	118.4	116.6	116.8
12	1994	122.7	122.7	121.6	121.5
13	1995	127.1	126.9	126.7	126.3
14	1996	131.4	131.2	132.1	131.4
15	1997	135.8	135.4	137.6	136.7
16	1998	140.1	139.7	143.4	142.2
17	1999	144.5	143.9	149.5	147.9
18	2000	148.9	148.1	155.8	153.8
19	2001	153.2	152.4	162.4	160.0
20	2002	157.6	156.6	169.3	166.4
21	2003	162.0	160.9	176.4	173.1
22	2004	166.3	165.1	183.8	180.1
23	2005	170.7	169.4	191.6	187.3
24	2006	175.0	173.6	199.7	194.8
25	2007	179.4	177.9	208.1	202.6
26	2008	183.8	182.1	216.9	210.8
27	2009	188.1	186.4	226.1	219.2
28	2010	192.5	190.6	235.6	228.0
29	2011	196.9	194.8	245.6	237.2
30	2012	201.2	199.1	256.0	246.7
31	2013	205.6	203.3	266.8	256.6
32	2014	210.0	207.6	278.0	266.9
33	2015	214.3	211.8	289.8	277.7
34	2016	218.7	216.1	302.0	288.8
35	2017	223.0	220.3	314.8	300.4
36	2018	227.4	224.6	328.1	312.5
37	2019	231.8	228.8	341.9	325.0
38	2020	236.1	233.0	356.4	338.1
39	2021	240.5	237.3	371.4	351.6
40	2022	244.9	241.5	387.1	365.7
41	2023	249.2	245.8	403.5	380.4
42	2024	253.6	250.0	420.5	395.7
43	2025	258.0	254.3	438.3	411.6
44	2026	262.3	258.5	456.8	428.1
45	2027	266.7	262.8	476.1	445.3
46	2028	271.0	267.0	496.2	463.2
47	2029	275.4	271.3	517.1	481.8
48	2030	279.8	275.5	539.0	501.1

ATTACHMENT C-11





ATTACHMENT C-12

EFFECT OF ANNUAL INFLATION ON ESTIMATED FUTURE COST SAVINGS
"STANDARDIZED" RCRA PERMIT PROPOSAL

	Row item	Period of analysis year	A. Projected Annual Labor Cost Index* S/L Govt	A. Projected Annual Labor Cost Index* Industry	B. Conversion to Base Year = 1.000 Index S/L Govt	B. Conversion to Base Year = 1.000 Index Industry	C. Base Case** Non-Inflated Cost Savings Estimate S/L Govt	C. Base Case** Non-Inflated Cost Savings Estimate Industry	C. Base Case** Non-Inflated Cost Savings Estimate Combined (Govt+Indstry)	D. Estimated Future Cost Savings Adjusted for Labor Cost Inflation S/L Govt	D. Estimated Future Cost Savings Adjusted for Labor Cost Inflation Industry	D. Estimated Future Cost Savings Adjusted for Labor Cost Inflation Combined (Govt+Indstry)
Base>>	1	2001	153.2	152.4	1.000	1.000	($283,374)	($67,872)	($351,246)	($283,374)	($67,872)	($351,246)
	2	2002	157.6	156.8	1.028	1.028	($283,374)	($67,872)	($351,246)	($291,443)	($69,763)	($361,206)
	3	2003	162.0	160.9	1.057	1.056	($283,374)	($67,872)	($351,246)	($299,518)	($71,653)	($371,166)
	4	2004	166.3	165.1	1.085	1.084	($283,374)	($67,872)	($351,246)	($307,582)	($73,544)	($381,126)
	5	2005	170.7	169.4	1.114	1.111	($283,374)	($67,872)	($351,246)	($315,651)	($75,435)	($391,086)
	6	2006	175.0	173.6	1.142	1.139	($285,680)	($86,691)	($372,371)	($326,355)	($98,765)	($425,121)
	7	2007	179.4	177.9	1.171	1.167	($287,818)	($104,133)	($391,951)	($336,998)	($121,587)	($458,586)
	8	2008	183.8	182.1	1.199	1.195	($287,818)	($104,133)	($391,951)	($345,189)	($124,438)	($469,627)
	9	2009	188.1	186.4	1.228	1.223	($287,818)	($104,133)	($391,951)	($353,385)	($127,339)	($480,724)
	10	2010	192.5	190.6	1.256	1.251	($287,818)	($104,133)	($391,951)	($361,581)	($130,239)	($491,820)
	11	2011	196.9	194.8	1.285	1.279	($287,818)	($104,133)	($391,951)	($369,777)	($133,140)	($502,917)
	12	2012	201.2	199.1	1.313	1.306	($287,818)	($104,133)	($391,951)	($377,973)	($136,041)	($514,013)
	13	2013	205.6	203.3	1.342	1.334	($287,818)	($104,133)	($391,951)	($386,168)	($138,942)	($525,110)
	14	2014	210.0	207.6	1.370	1.362	($287,818)	($104,133)	($391,951)	($394,364)	($141,842)	($536,207)
	15	2015	214.3	211.8	1.399	1.390	($287,818)	($104,133)	($391,951)	($402,560)	($144,743)	($547,303)
	16	2016	218.7	216.1	1.427	1.418	($287,818)	($104,133)	($391,951)	($410,756)	($147,644)	($558,400)
	17	2017	223.0	220.3	1.456	1.446	($287,818)	($104,133)	($391,951)	($418,952)	($150,544)	($569,496)
	18	2018	227.4	224.6	1.484	1.474	($287,818)	($104,133)	($391,951)	($427,148)	($153,445)	($580,593)
	19	2019	231.8	228.8	1.513	1.501	($287,818)	($104,133)	($391,951)	($435,344)	($156,346)	($591,690)
	20	2020	236.1	233.0	1.541	1.529	($287,818)	($104,133)	($391,951)	($443,540)	($159,247)	($602,786)
	21	2021	240.5	237.3	1.570	1.557	($287,818)	($104,133)	($391,951)	($451,736)	($162,147)	($613,883)
	22	2022	244.9	241.5	1.598	1.585	($287,818)	($104,133)	($391,951)	($459,932)	($165,048)	($624,980)
	23	2023	249.2	245.8	1.626	1.613	($287,818)	($104,133)	($391,951)	($468,128)	($167,949)	($636,076)
	24	2024	253.6	250.0	1.655	1.641	($287,818)	($104,133)	($391,951)	($476,323)	($170,849)	($647,173)
	25	2025	258.0	254.3	1.683	1.669	($287,818)	($104,133)	($391,951)	($484,519)	($173,750)	($658,269)
	26	2026	262.3	258.5	1.712	1.696	($287,818)	($104,133)	($391,951)	($492,715)	($176,651)	($669,366)
	27	2027	266.7	262.8	1.740	1.724	($287,818)	($104,133)	($391,951)	($500,911)	($179,551)	($680,463)
	28	2028	271.0	267.0	1.769	1.752	($287,818)	($104,133)	($391,951)	($509,107)	($182,452)	($691,559)
	29	2029	275.4	271.3	1.797	1.780	($287,818)	($104,133)	($391,951)	($517,303)	($185,353)	($702,656)
	30	2030	279.8	275.5	1.826	1.808	($287,818)	($104,133)	($391,951)	($525,499)	($188,254)	($713,752)
Non-Discounted column tota				Avg	2.10%	2.06%	($8,610,172)	($2,925,243)	($11,535,415)	($12,173,821)	($4,174,522)	($16,348,343)
Average Annual Savings (non-discounted*) =**							($287,006)	($97,508)	($384,514)	($405,794)	($139,151)	($544,945)

Explanatory Notes:

(a) * Projection is based on regression analysis of historical data for 1983-1999 from the Bureau of Labor Statistics for the US "Employment Cost Index". Refer to supplementary attachments in this document for regression results and graphs of historical and regression trend projections.

(b) ** "Base Case" represents the estimated future average annual savings valued in 1999 "constant" dollars (i.e. at the base year labor cost level). In other words, "constant" dollars is the simplifying case of 0% annual inflation, as is usually applied in economic analysis frameworks.

(c) In contrast, expressing future savings according to annual inflation rates provides alternative "nominal" or "current" dollar valuations at different price levels. Nominal (i.e. non-constant) dollar valuation is often used for financial analysis purposes such as cash-flow budgeting. In this case, the source of possible future inflation of annual cost savings is the labor cost rates associated with burden hour reduction.

(d) *** Total and average annual cost savings in this table are not discounted, because the purpose of inflation-adjustment is to provide a cash-flow type stream.

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